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# THE KINETICS OF POLYMER CURE BY DIFFERENTIAL SCANNING CALORIMETRY

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The need for providing processing information for new resins requires obtaining the reaction kinetics for polymerization of these resins. The kinetic parameters can be used to generate reaction window plots. Because of the exothermic nature of these reactions, differential scanning calorimetry (DSC) was utilized to obtain the kinetic parameters. Multiple-scan DSC curves at several heating rates were utilized applying the Friedman method of kinetic analysis. This method, which obtains activation energies at each extent of conversion, allows

kinetic parameters to be evaluated without having to assume any apriori functionality for the rate dependency. The kinetic parameters so obtained are then utilized to predict the behavior of reacting systems under a variety of isothermal conditions. This behavior is displayed in reaction window plots. The method is described, and includes descriptions of computer programs with illustrated data from the cure of new resins.

# FOREWORD

This report was prepared by the Polymer Branch, Nonmetallic Materials Division. The work was initiated under Project No. 2419, "Structural Materials", Task No. 241904, Work Unit Directive 24190415, "Structural Resins." It was administered under the direction of the Materials Laboratory, Air Force Wright Aeronautical Laboratories, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio, with Dr. F. E. Arnold as the Project Scientist. Co-authors were Mr. W. W. Adams and Dr. I. J. Goldfarb. This report covers research conducted from 1 July 1976 to 30 June 1981.

The authors gratefully acknowledge the technical assistance of Ms. Marlene Houtz, Mr. Gary Doll, and Mr. Thomas Grossman, especially in the areas of programming and experimental testing of the method.

We also acknowledge the permission granted by Perkin Elmer Corporation (Dr. Bruce Castle) for reprinting several subroutines.

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# INTRODUCTION

The need for providing processing information on new resins in this laboratory requires obtaining the reaction kinetics for polymerization of these resins. The kinetic parameters can then be used to generate reaction window plots. Because of the exothermic nature of these polymerization reactions, differential scanning calorimetry (DSC) is an effective method to obtain the kinetic parameters.

A number of methods have been reported in the literature for determining reaction kinetics by DSC. Many of these attempt to obtain the kinetic parameters from a single DSC scan. A review of some of these has appeared recently (Reference 1). Single scan DSC kinetic analysis has inherent difficulties especially when the reaction order is not known or if the reaction rate data do not justify the use of a reaction order function. The consequences of the use of single scan kinetics were well described by Flynn and Wall (Reference 2) for the analogous case of thermogravimetric analysis. In this report, the use of the Friedman method of kinetic analysis of thermogravimetry (Reference 3) is applied to DSC measurements of resin cure.

# SECTION II

# THEORY

## 1. KINETIC ANALYSIS

Let us define a variable $\alpha$, the conversion factor ($0 \leq \alpha \leq 1$), which is the amount or fractional conversion of reactants to products. In general, r, the rate of the process can be considered to be a product of factors involving both $\alpha$ and temperature:

$$r = \frac{d\alpha}{dt} = k(T)f(\alpha) \tag{1}$$

The rate is also a function of pressure, but for our purposes pressure is a constant and will be neglected. k is called the "rate constant" and is independent of the concentrations of the reactants but is a function of temperature.

The dependence of k upon T is usually given by:

$$\frac{d(\ln k)}{dT} = \frac{E_A}{RT^2} \tag{2}$$

where T is the temperature, R is the usual Gas Constant, and the activation energy $E_A$ is constant. Hence, the familiar Arrhenius equation arises upon integration:

$$k = A\, e^{-\frac{E_A}{RT}} \tag{3}$$

and the activation energy is interpreted as the energy needed for a molecular species to become reactive. In a reacting system an equilibrium exists between ordinary and active molecules. $E_A$ is the difference between the average energy of the active molecules and the average energy of all the molecules. The two averages must have the same temperature dependence for the Arrhenius equation to be valid (Reference 4). Substituting Equation 3 into Equation 1 yields

$$\frac{d\alpha}{dt} = Ae^{-E/RT}f(\alpha) \tag{4}$$

The other factor in the rate equation, $f(\alpha)$, is generally derived experimentally by plotting different functions of $\alpha$ against time. As an analogy to many chemical reactions in solution one might consider $f(\alpha)$ to be of the form:

$$f(\alpha) = 1-\alpha)^n \tag{5}$$

where n is called the order of the reaction. In this case since conversion is used rather than the usual kinetic form which utilizes some form of concentration of reactant(s), this should be more appropriately called the "apparent" order. If the volume change during reaction were known, conversion units could be converted to concentration units.

The simplest case of Equation 5 is when $n = 1$ or a first order reaction. Then, if temperature is constant, Equation 1 reduces to

$$d\alpha/dt = k\ (1-\alpha) \tag{6}$$

or the rate of change of conversion decreases proportionally with the concentration of reactant(s).

While an expression of the form of Equation 5 is not always valid, particularly in bulk reactions, it still represents a useful starting point for describing experimental reactions. In the case of solid state or viscous state reactions, however, any kinetic analysis of experimental data should not initially require a reaction "order" form of rate dependency.

Consider experiments conducted under different conditions, e.g., different heating rates, such that a certain constant degree of conversion ($\alpha$) is attained for each experiment at different temperatures. Then assuming that $f(\alpha)$ is not a function of temperature, i.e., the mechanism does not change over the temperature range considered, Equation 1 can be rewritten:

$$\ln \frac{d\alpha}{dt} = - \frac{E}{R}\frac{1}{T} + \ln Af\ (\alpha) \tag{7}$$

Since $\alpha$ is a constant, $f(\alpha)$ is also constant and the second term on the right side of Equation 7 is a constant. Thus, a plot of $\ln d\alpha/dt$ vs. $1/T$ for the several experiments should yield a straight line with a slope equal to $-E/R$ and an intercept equal to $\ln Af(\alpha)$. An activation energy can be obtained without making any assumption as to the reaction "order" or rate dependency. Repeating this process at different values of $\alpha$ can verify that the activation energy is indeed constant during the course of the reaction. If not, it indicates that Equation 4 is not a valid representation of the reaction and alternate expressions should be tried.

Having determined an average $E_a$ over the whole reaction as described previously, values of $d\alpha/dt$ and $T$ at various values of $\alpha$ can be substituted into Equation 6 giving $Af(\alpha)$ as a function of $\alpha$. The rate dependency can be determined in this manner without having to assume any a priori functionality. If a plot of $\ln Af(\alpha)$ vs. $\ln(1-\alpha)$ results in a straight line then the slope of that line gives the reaction order $n$ of Equation 5 as well as the pre-exponential factor $A$. If the plot is not a straight line either some other functional form can be tested or a numerical table of $Af(\alpha)$ vs. $\alpha$ may have to suffice, as described below.

Having obtained the kinetic parameters, one can utilize them to predict the behavior of the reacting system under a variety of isothermal reaction conditions. This is displayed in a so-called "reaction window plot," the source of which can be described as follows:

If temperature is held constant, Equation 4 can be rearranged and integrated to yield

$$\int_0^{\alpha} \frac{d\alpha}{Af(\alpha)} = e^{-E/RT} \int_0^{\tau} dt \qquad (8)$$

The left-hand side of Equation 8 is a function of $\alpha$ which we can call $g(\alpha)$ and, if the functional form of $f(\alpha)$ is known, can be

expressed analytically. If not, $g(\alpha)$ as a function of $\alpha$ can be obtained by numerical integration of $1/Af(\alpha)$ as a function of $\alpha$. Thus, Equation 8 becomes

$$g(\alpha) = te^{-E/RT} \tag{9}$$

or rearranging and taking logarithms of both sides,

$$\ln t = \frac{E}{R} \cdot \frac{1}{T} + \ln g(\alpha) \tag{10}$$

which relates reaction time to extent of conversion for each temperature. Plots of ln t vs. 1/T will give parallel straight lines for each extent of conversion. These are called reaction window plots since they indicate how long one can process reactants before any appreciable reaction has occurred and how long one must heat them at any given temperature before the reaction is essentially complete. It is for this reason that our reaction window plots show lines for $\alpha = 0.05$ (5% conversion) and $\alpha = 0.95$ (95% conversion) as well as $\alpha = 0.5$ (50% conversion), to show the extremes of the reaction. It should be emphasized that while 1/T is plotted on the abcissa of the reaction window plots, the plots display times for isothermal reactions.

## 2. DIFFERENTIAL SCANNING CALORIMETRY

Differential Scanning Calorimetry, first described in 1964 (Reference 5), is a scanning thermal analysis technique utilizing insulated sample and reference holders maintained at the same temperature by a closed loop electrical system (Figure 1). The energy per unit time absorbed or released by the sample is exactly compensated by a corresponding increase or decrease in the electrical power to the heaters, such that equivalent temperature of the two holders is maintained. The measure of the electrical power applied is equivalent to the heat flow of the system to the sample. Thus, the DSC is an <u>energy</u> measuring device, while other familiar thermal analysis instruments (such as differential thermal analysis, (DTA)) are <u>temperature</u> measuring devices.

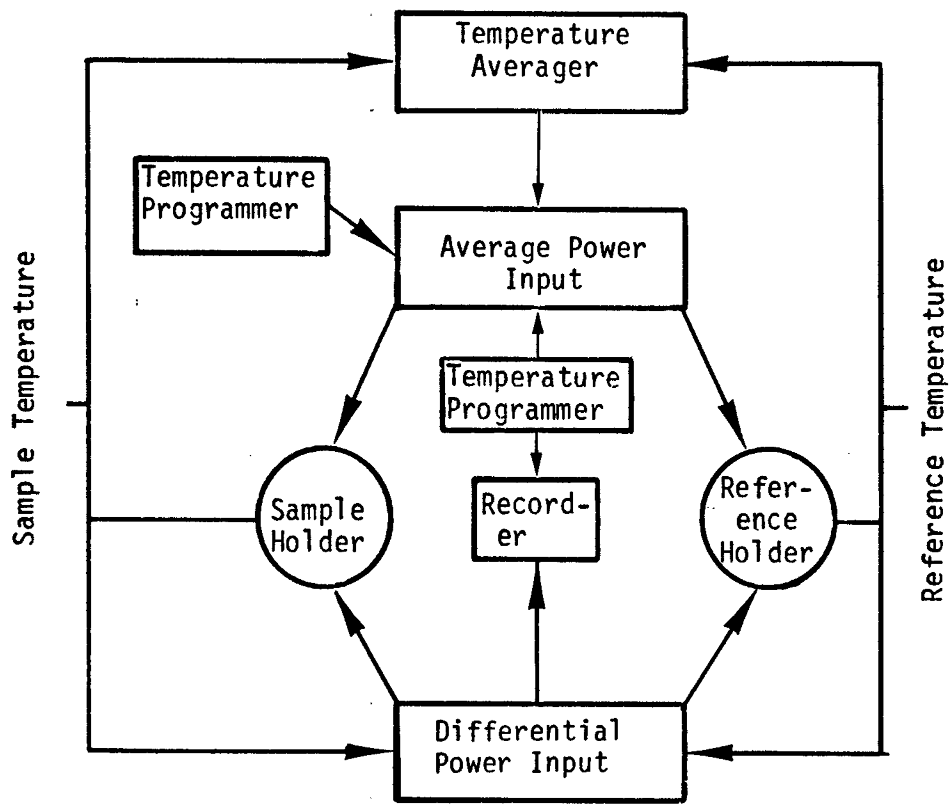


Figure 1. Differential Scanning Calorimeter, Simplified Diagram (Modification of Drawing in Reference 8)

A simplified view of a thermal analysis cell is shown in Figure 2. The sample and its holder are at temperature $T_s$, the thermal energy source is at temperature $T_p$, and the total resistance to the heat flow dq/dt is R, a sum of resistance between the pan and the sample, and the resistance of the sample itself. If care is taken to insure good thermal contact between the sample, the pan, and the heater, the thermal resistance can be minimized, but it is an effect which must be compensated for in DSC measurements.

If we assume that the temperature of the sample and pan are uniform and equal, and that the heat capacity of the sample and pan and the thermal resistance R are constant over the range of interest, then:

$$\frac{dh}{dt} = C_s \frac{dT_s}{dt} - \frac{dq}{dt} \tag{11}$$

where the sample produces heat $\frac{dh}{dt}$ in an exothermic reaction (dh/dt is considered positive for an exothermic reaction). Heat flow dq/dt to the sample is taken as positive, and Equation 11 indicates that heat either produced by the sample or absorbed from the energy source must increase the sample temperature or be lost to the surroundings. The heat loss is controlled by the value of R, and in an analogy with electrical circuits, the heat current is equal to the potential difference (temperature) divided by the resistance:

$$\frac{dq}{dt} = \frac{T_p - T_s}{R} \tag{12}$$

This is Newton's Law, the thermal analogy of Ohm's Law. If we take the time derivative of Equation 12

$$\frac{d\left(\frac{dq}{dt}\right)}{dt} = \frac{\frac{dT_p}{dt}}{R} - \frac{\frac{dT_s}{dt}}{R} \tag{13}$$

and if we consider a sharply melting standard material such as indium, $\frac{dT_s}{dt} = 0$ during melting. Hence, during melting, the slope of the curve

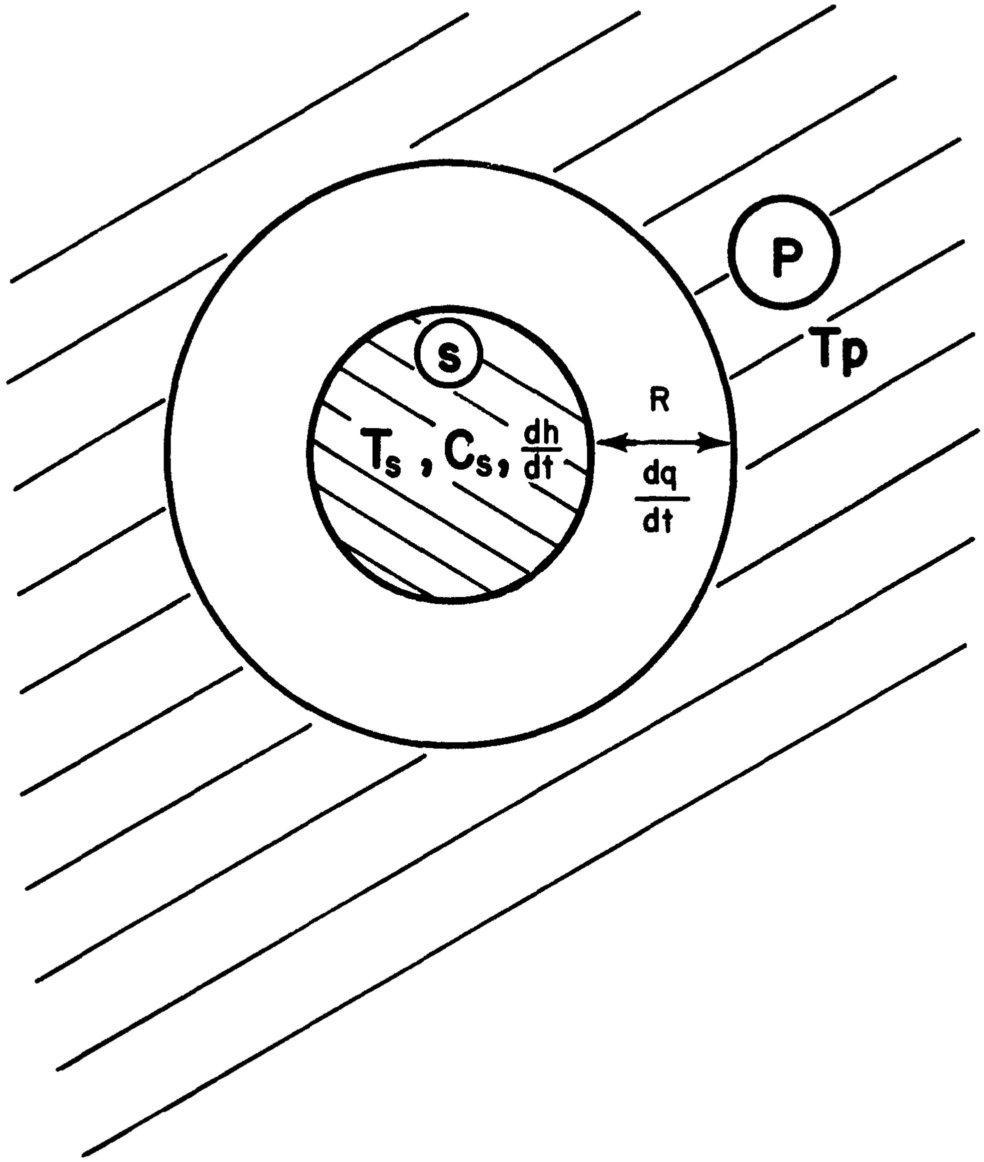


Figure 2. Simplified Differential Scanning Calorimeter Sample Cell. Sample and Holder (S), Thermal Energy Source or Sink (P)

generated, $\frac{d\left(\frac{dq}{dt}\right)}{dt}$, is equal to the programmed temperature rate $\frac{dT_p}{dt}$ divided by the thermal resistance R. This provides the correction method commonly used in DSC analysis: a value of R is calculated for each heating rate used in scanning a sharply melting standard (indium), as shown in Figure 3.

This value of R is then used to calculate the actual temperature at any point on an actual data curve of interest. For example, in Figure 4, the true temperature at the peak height is not $T_A$, but is actually found to be $T_B$ by constructing a line of slope $\frac{dT}{dt}\frac{1}{R}$ from the peak height at A to the intercept on the temperature axis. This correction typically ranges from 0.2° for an ultra pure, sharply melting material to several tens of degrees for other less pure materials with broad melting curves or curves showing other thermal phenomena (Reference 6).

Obviously, the greatest accuracy in temperature measurements is achieved with small sample size, proper encapsulation in the sample pan (i.e., no bending of the flat pan bottom), and slow heating rates. A balance between sensitivity, which increases with scan rate, and accuracy is possible by reducing thermal resistance by experimental techniques and performing a correction for thermal lag and scan rate error.

Another error considered is that of absolute calibration error and scan rate/temperature nonlinearity. The usual method of correcting for the latter effect involves measuring melting points of a number of standard materials and calculating a polynomial fit between the $T_m$'s and the indicated temperatures (Reference 7). The correction was not accomplished in this study since over the limited range of temperatures involved, the error is not large, and a linear correction was applied instead. The error due to inaccuracy in the calibration points and the scan rate error can be described by

$$T_{true} = T_{obs} - C\ dT/dt + D \qquad (14)$$

where the coefficients can be evaluated from two melting points.

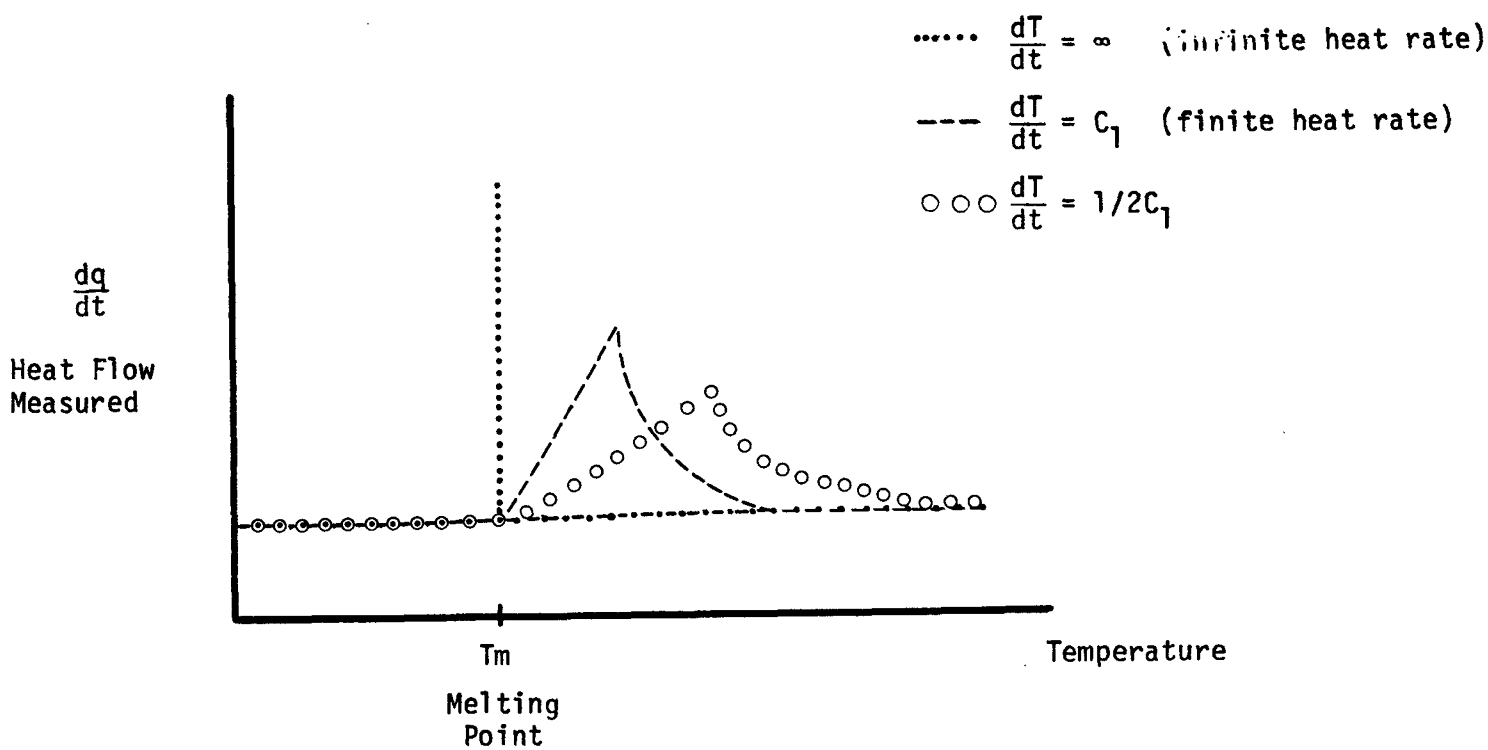


Figure 3. Differential Scanning Calorimeter Simulated Curves for a Sharply Melting Standard. Slopes of two finite heat rate curves ($C_1$, $\frac{1}{2}C_1$) are equal to $C_1/R$ (or $\frac{dT}{dt} \cdot \frac{1}{R}$) and $\frac{1}{2}C_1/R$ (or $\frac{dT}{dt} \cdot \frac{1}{2R}$) respectively, where R is the thermal resistance

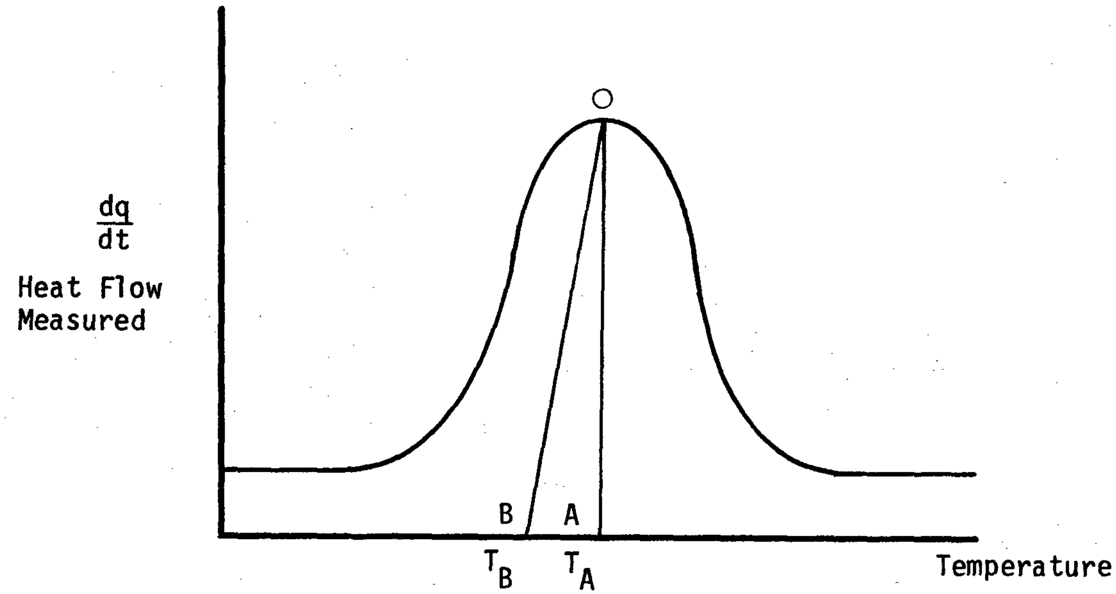


Figure 4. Differential Scanning Calorimeter Simulated Curve for Non-Sharply Melting Sample (or Any Other Broad Thermal Phenomenon). Slope of OB is $\frac{dT}{dt} \cdot \frac{1}{R}$, $T_A$ is measured temperature at peak height, $T_B$ is actual temperature

## 3. KINETIC ANALYSIS BY DIFFERENTIAL SCANNING CALORIMETRY

The Differential Scanning Calorimeter (DSC) produces a plot of dH/dt versus time t (or temperature T), where dH/dt is either the rate of heat input (endotherm) or heat output (exotherm) in millicalories/second. The total area under the thermogram curve (Figure 5) defines the heat of reaction $\Delta H$. The area of a small section of this peak, a, corresponds to the fractional heat evolved up to time t (or temp T) and is proportional to the extent of conversion ($\alpha$),

$$\alpha = \frac{a}{\Delta H} \tag{15}$$

or more generally

$$\alpha(t) = \frac{1}{\Delta H} \int_{t_o}^{t} \frac{dH}{dt}\, dt \tag{16}$$

where $t_o$ is the time for the onset of the exotherm or endotherm.

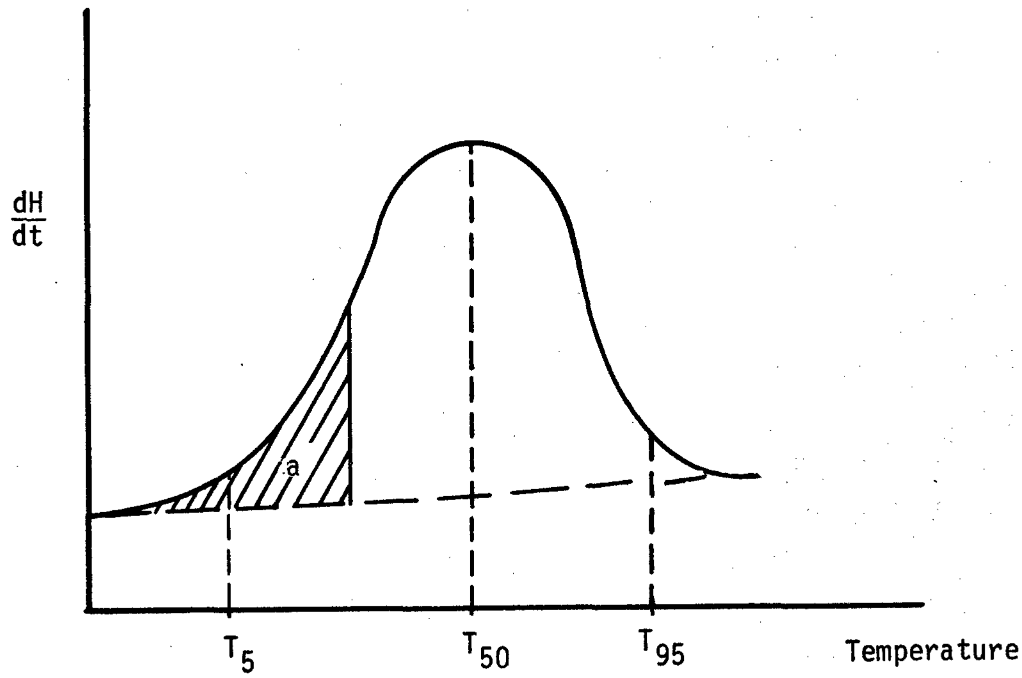


Figure 5. Typical Differential Scanning Calorimeter Curve. Indicated is the Partial Peak Area, a; the Total Area Is Equal to the Heat of Reaction, ΔH. $T_5$, $T_{50}$, and $T_{95}$ are respectively the temperatures for 5%, 50%, and 95% completion of the reaction.

# SECTION III

# EXPERIMENTAL

## 1. INSTRUMENTATION

Thermal data were obtained using a Perkin Elmer DSC-2 differential scanning calorimeter with analog output display on a Perkin Elmer Model 56 strip chart recorder. BCD temperature output and heat signal from the DSC were recorded on punched paper tape by means of a Hewlett-Packard Model 2570A Coupler/Controller, a Hewlett Packard Model 3480B Digital Voltmeter, and a Teletype Corporation Model 33 teletype. Computer calculations were performed on the WPAFB-ASD Computer Center Cyber 175, and all programs were written in Fortran Extended.

## 2. CALIBRATION

The DSC was calibrated in the manner described in the operations manual (Reference 8). Cooling rates were carefully controlled to avoid super cooling of the standards. Absolute temperature calibration was checked by examining the melting points of high purity indium and lead at different heating rates, and constructing a temperature correction curve for each heating rate, the intercept and slope of which were calculated in program kinetic (Appendix B). Program CALIB (Appendix A) was used to determine the value of the thermal resistance factor (TR) for each scanning rate. This program performs a peak analysis of the melting endotherm for the standard, and prints out the values of TR and the observed melting point (Appendix A.2). CALIB is a modified version of a standard program provided to DSC users by The Perkin Elmer Corporation (Reference 7).

## 3. DATA COLLECTION

Data for each material was collected for a set of at least four heating rates. The coupler/controller was used to initiate the temperature program of the DSC, and measurements of the signal voltage were made by

the DVM at intervals of 0.8 seconds or longer (limited by the maximum punching rate of the teletype). For each specimen, three runs were made. First a scan of the empty sample pan was performed to provide a background level, then the sample was introduced into the pan and data was collected through the temperature program. The background scan was subtracted from the peak data scan to produce a corrected data set (Reference 9). After completion of the curing scan, the sample was rescanned to determine if cure was complete and to determine a glass transition temperature (Tg). Samples were weighed before and after scanning, and all samples were scanned under a nitrogen atmosphere. Sample DSC scans are shown in Figure 6.

## 4. DATA REDUCTION

Punched paper tapes were either converted into punched cards using a utility program or were read directly onto a disk file by remote terminal. After checking the data to eliminate any obvious errors, the program KINETIC in Appendix B was executed. Sample data, required data cards, and typical output of KINETIC are listed in Appendixes B.1, B.2, and B.3, respectively.

## 5. COMPUTER PROGRAMS

Several computer programs have been utilized to perform the kinetic analysis. Each will be summarized briefly and the main subroutines will be listed and their functions described. Those subroutines which are identified with an asterisk are unmodified or slightly modified versions of standard Perkin Elmer routines, and are printed with the permission of the Perkin Elmer Corporation, Norwalk, Connecticut (Attn: Dr. Bruce Castle).

### a. Program KINETIC (see Volume II for program listing)

This program is a general data reduction program for transforming raw data from the DSC into conversion rate versus time or temperature data for kinetic analysis. Kinetic parameters are ultimately

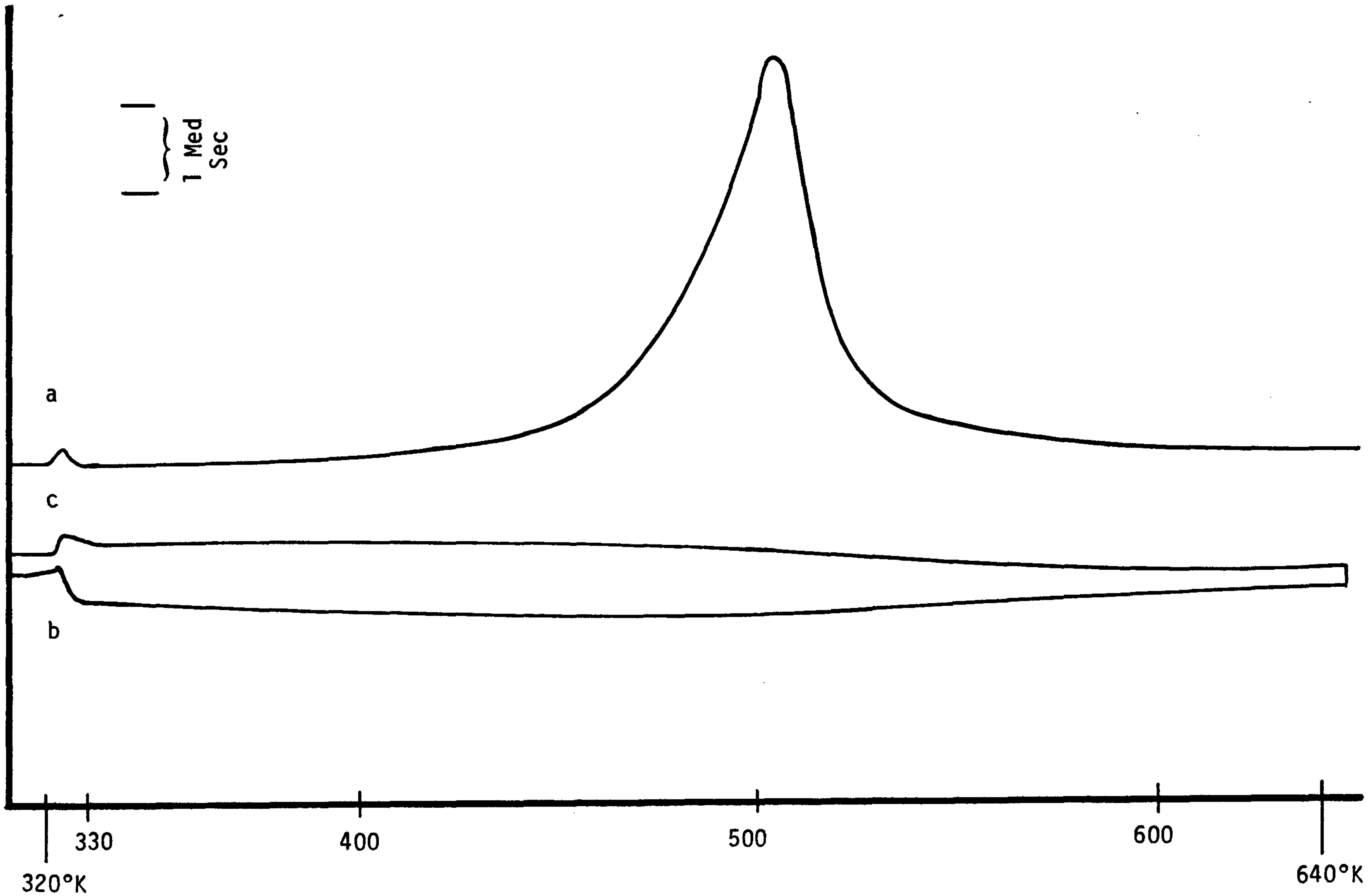


Figure 6. DSC Curves for Acetylene Terminated Sulfone Specimen and Background (Strip-Chart Recording). Scan rate 20° minute, range 10 mcal/sec, curves are arbitrarily shifted vertically. a. Curing Curve, b. Baseline for a (taken of an empty sample pan before a was run), c. Cured sample, rerun after a

produced, including activation energy and reaction order. Each subroutine will be summarized briefly to indicate its function.

KINETIC - Calls individual subroutines depending upon mode of operation, repeats for multiple data sets. Comments list all data formats.

PRELIM - Initializes control constants, reads input cards to select options and to set values of thermal resistance and scan rate temperature correction factors.

INREAD - Reads data file for scan rate, range, initial temperature, and data rate information followed by raw data for each curve. Calls INPUTT for actual reading of the raw data. If background subtraction option used, calls SUBBAK which in turn uses INPUTT to read background data. Calls COUPLR to analyze each peak.

COUPLR - Peak processing subroutine, applies thermal resistance and scan rate corrections, senses the peak, truncates if desired, applies baseline correction, fills the two main data arrays (DHDT and TEMP), and copies the data to the output data file if desired.

CVPLOT - Calcomp plotting routine for the set of up to six curves for a graph.

PREKIN - Calculates area under a curve and cumulative areas for 0.01 intervals of conversion. Data is interpolated to calculate $\frac{dc}{dt}$, c, time, and temperature for each value of c from 0.01 to 0.99. Calls subroutine TGA3 for kinetics analysis.

TGA3 - Modified subroutine TGA3 from Reference 10.

POSTLM - Reinitializes to the main program or terminates execution if job is complete.

FITY - Utility for FT.

FT - Performs a three-point fit and interpolate operation.

NUC005 - Controls page skips and numbering and title printing for printer control.

NUC008 - Writes benchmarks, elapsed running or execution time and time since last call.

PRPLOT - Calls subroutine GP to produce a one page printer plot of data when requested by various calls in the main subroutines. Provides the proper heading for the plot depending upon the value of N in the call.

SUBBAK - calls INPUTT to read the background data, and subtracts point by point since the data are required to be at the same starting temperature and data rate.

TEMPTR - Corrects a given temperature for thermal resistance and applies the scan rate correction.

TK - Utility for FT.

KINETIC - also uses some utility routines listed under program CALIB.

b. Program CURE

This program uses the output kinetic parameters from program KINETIC to produce a processing window plot. This plot indicates time-temperature factors for various degrees of cure desired. The program consists of only one main routine (CURE), which reads kinetic factors from the teletype or $g(\alpha)$ data from a file (from KINETIC). The temperature - cure time - cure amount (degree of conversion) relationships are then calculated and plotted in a convenient graphic form on the plotter. (See Appendix C for input and output).

c. Program CALIB

This program is a modified version of a Perkin-Elmer Co. supplied routine to calculate the calibration constants for the DSC. It locates the melting peak of the standard employed after subtracting baseline curvature, calculates a least-squares background on either side of

the peak, integrates the peak (to find heat of fusion), and locates the true melting temperature for that peak. Subroutines included in this program are:

CALIB - Main routine, reads sample identification, and other data about the standard, calls INPUTT to read peak and background data, locates the maximum (calls IMAX), beginning and end of the endotherm (calls PEAK twice), and integrates (INTGRA). The leading edge of the peak is considered to be indicative of the thermal resistance (TR) of the system at that scan rate, and subroutine DER is used to obtain the maximum slope of that edge. The area heat constant which converts encoder readings (ordinate values from the coupler-controller) to cal/sec in absolute units is obtained from the area of the peak and the heat of fusion of the sample. TR is applied to the peak maximum to obtain the true melting temperature for the standard. A printer plot of the data and all values of constants are then printed. The program cycles through as many data sets as desired.

INPUTT - Reads the input file for raw data and fills array Y or YB with M or MM points.

The following utility routines are used by either KINETIC or CALIB or both:

*BASE Calculates the value of the baseline at a point given the intercept and slope of the baseline function.

*DER Calculates the derivative at a point in an array.

*GP Produces one page line printer plot of the data requested.

*IMAX Finds the maximum value of an array.

*INTGRA Performs a Simpson's Rule integration.

*INVT Finds the data point index for a given temperature (not valid after thermal resistance correction is applied).

*PEAK Locates the beginning of a peak in an array of ordinate data.

*SLOPE Applies a least squares fit to ordinate data to obtain a straight line approximation.

*TEMPT Calculates the temperature of a data point knowing the initial temperature and the scan rate.

*TEMPTR Calculates the thermal resistance corrected temperature of a data point.

*YAV Finds average values of an array.

# SECTION IV

# RESULTS AND DISCUSSION

DSC curves for the reaction of an acetylene terminated sulfone resin (Reference 11) are shown in Figure 7. The values have been corrected for baseline and only show deviations from the baseline.

It should be noted that the integration of the DSC curves is as a function of time, not temperature, so that the abscissa actually used for the integration is the elapsed time from the beginning of the exotherm. Integrations are accomplished utilizing computer programs that interpolate the integrated values to integral percent conversions, i.e., for $\Delta\alpha = 0.01$. The data for $d\alpha/dt$ are plotted on a log scale vs. $1/T$ in Figure 8. The numbers beside each curve refer to the heating rate in degrees per minute. Points on each curve at a constant value of $\alpha$ should describe a straight line in accordance with Equation 7. Two such lines are drawn on Figure 8, one for $\alpha = 0.5$ and the other for $\alpha = 0.8$. The computer program evaluates the slope of the straight lines for each value of $\alpha$ thereby determining the activation energy as a function of extent of reaction. If all the lines are essentially parallel as in the case for this example, a single reaction is assumed whose activation energy is given by the average obtained from the slopes of the straight lines. Lack of constancy of activation energy as a function of conversion (and also temperature) is evidence for a more complex reaction scheme, and a warning not to proceed further with this method. In this case the slopes are quite constant giving an average activation energy of 25.06 kcal/mole. It should be noted that data on Figure 8 for early stages of reaction (i.e., the right side of each curve) are essentially superimposable and parallel to the constant conversion straight lines. That is because, at early extents of reaction, there is little loss of reactant and the reaction curve follows the Arrhenius function. Only after significant reaction has occurred do the curves start decreasing in slope due to loss of reactant.

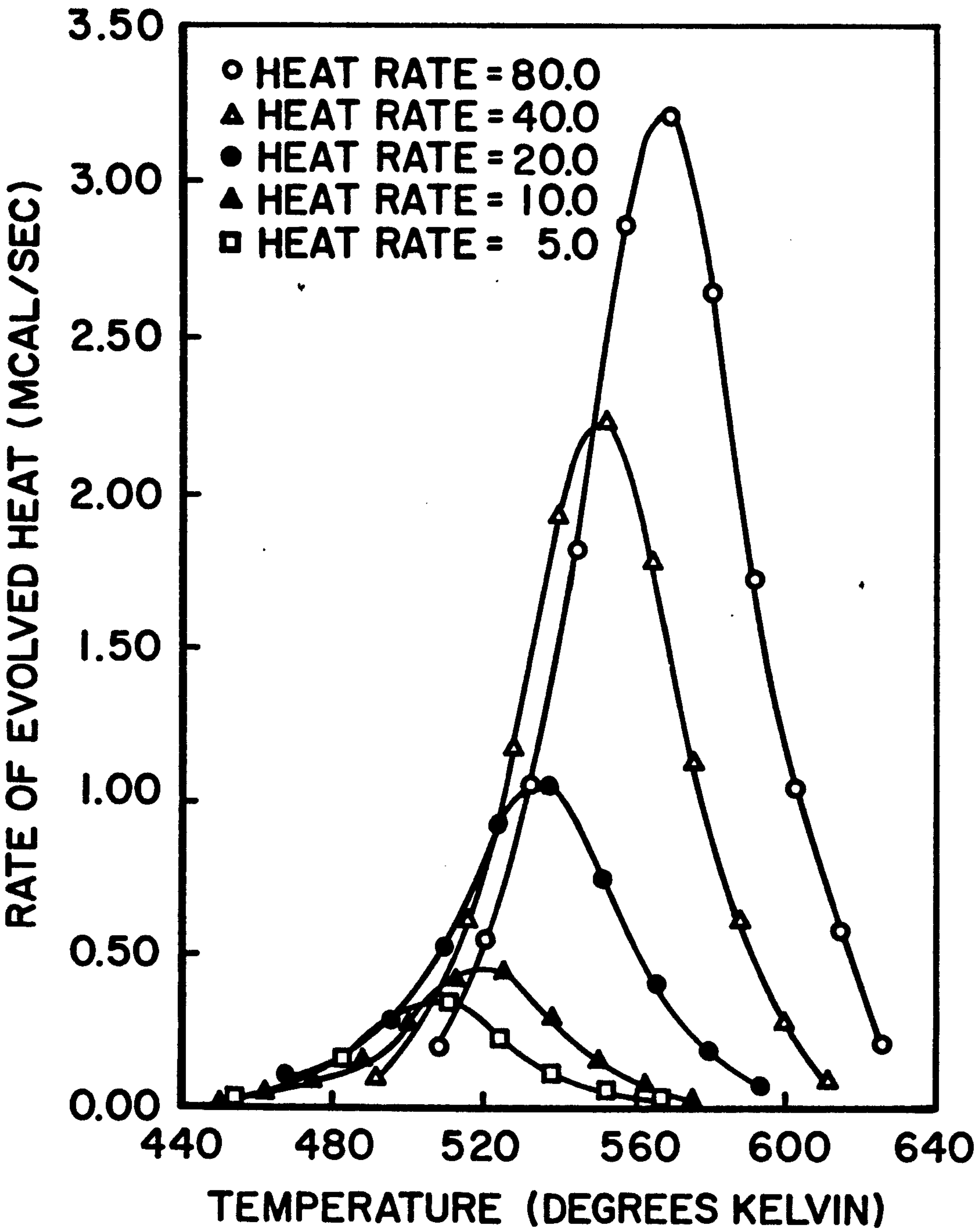


Figure 7. DSC Curves for Acetylene Terminated Sulfone Resin Cure

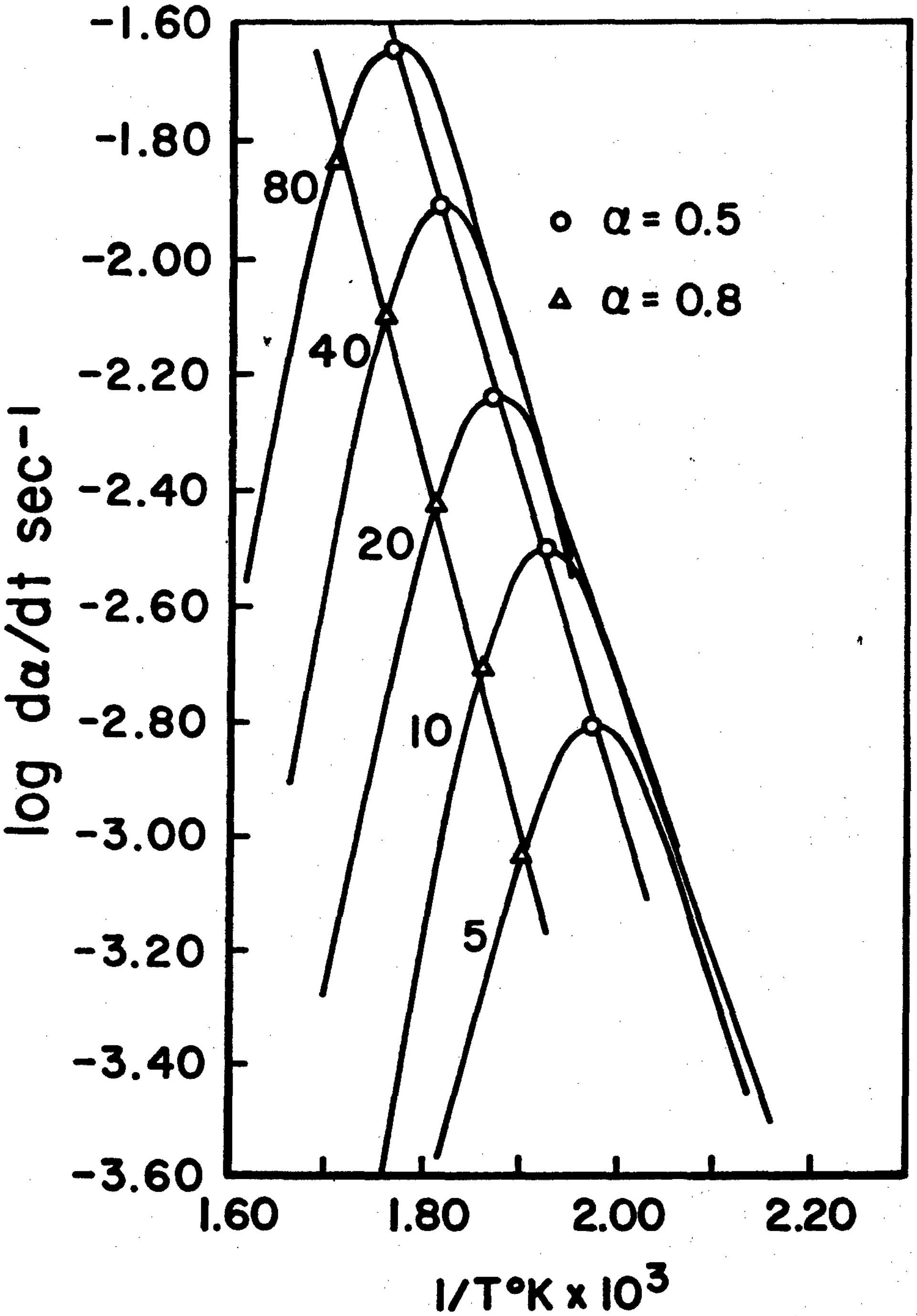


Figure 8. Arrhenius DSC Curve Plot for ATS Resin

Having obtained an activation energy, it can be substituted into Equation 7 along with the appropriate experimental values to obtain the log $Af(\alpha)$ as described previously. If log $Af(\alpha)$ vs. log $(1-\alpha)$ is a straight line the slope gives n, the apparent order of the reaction. In this case the values are log A = 8.3530 and n = 1.21. These values are substituted into Equation 10 yielding the reaction window plot given in Figure 9. This plot can be utilized to guide processing of resins as described previously.

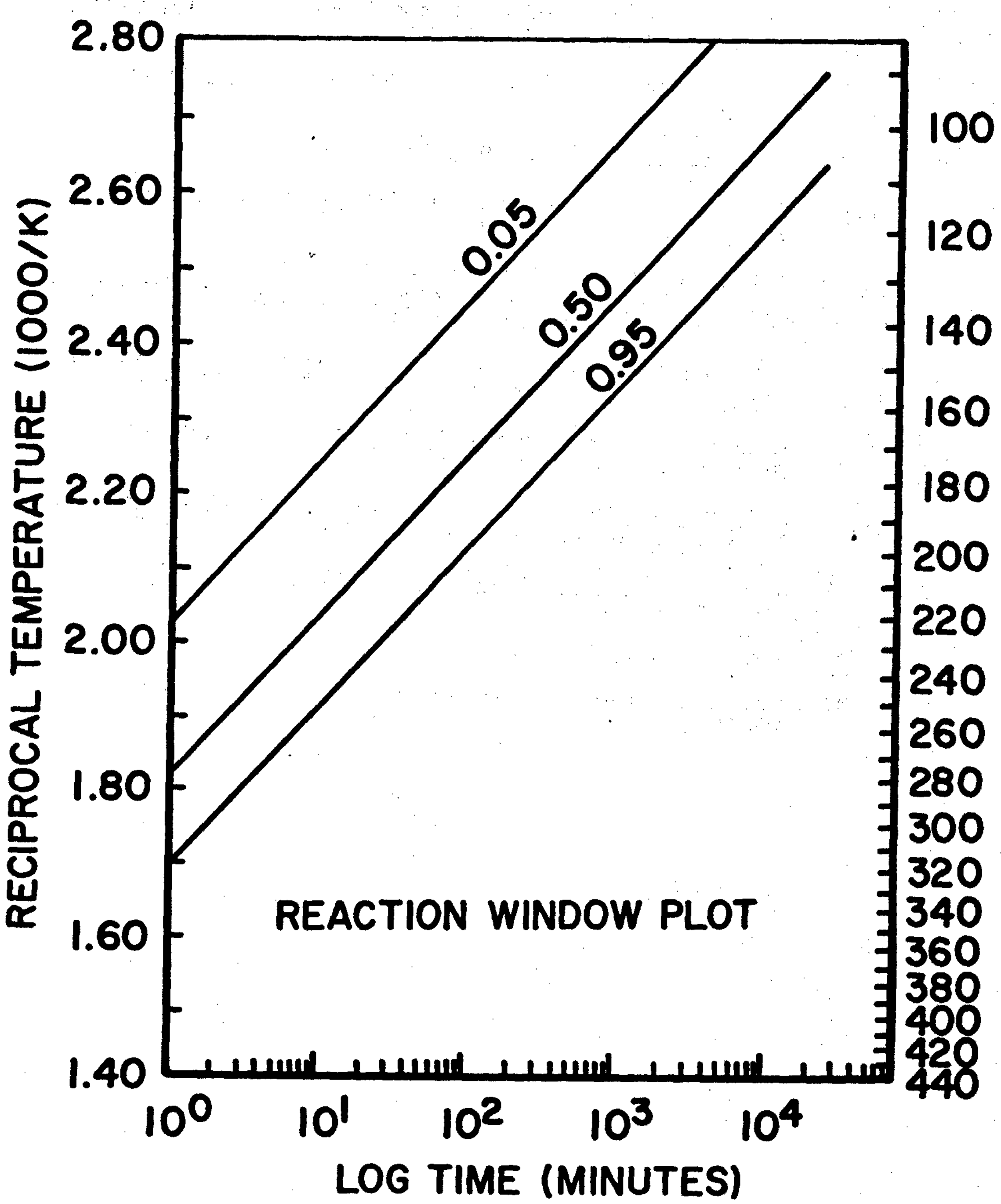


Figure 9. Reaction Window Plot for ATS Resin

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# APPENDIX A.1

## PROGRAM CALIB

## SAMPLE DATA FILE

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9.1
20.0
80.0
370.0
0.8
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 0321 0320 0320 0320 0320 0320 0320 0320
 0320 0320 0320 0320 0319 0319 0319 0318

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9.1
20.0
80.0
370.0
0.8
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 0337 0337 0337 0336 0336 0335 0335 0335
 0336 0336 0335 0335 0335 0334 0333 0333
 0333 0333 0333 0333 0332 0333 0333 0333
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 0331 0332 0331 0332 0331 0331 0331 0331
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 0321 0321 0320 0321

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9.1
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40.0
380.0
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 0277

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40.0
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0.8
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20.0
390.0
0.8
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0 81.10.7.13 INDIUM
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20.0
80.0
540.0
0.8
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40.0
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40.0
560.0
0.8
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0 81.10.7.20 LEAD
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4.9
10.0
10.0
590.0
0.8
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0 81.10.7.21 LEAD
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5.0
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595.0
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6.5
20.0
80.0
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540.0
0.8
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0 81.10.7.23 LEAD
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8.5
20.0
80.0
540.0
0.8
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0 81.10.7.24 LEAD
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20.0
40.0
560.0
0.8
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0 81.10.7.25 LEAD
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10.0
20.0
580.0
0.8
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 0259 0248 0227 0194 0152 0105 0055 0004
-0047-0099-0150-0203-0254-0306-0357-0409
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-0242-0041 0103 0190 0234 0253 0262 0263
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APPENDIX A.2

PROGRAM CALIB

SAMPLE OUTPUT

81.10.7.2 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 9.100

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

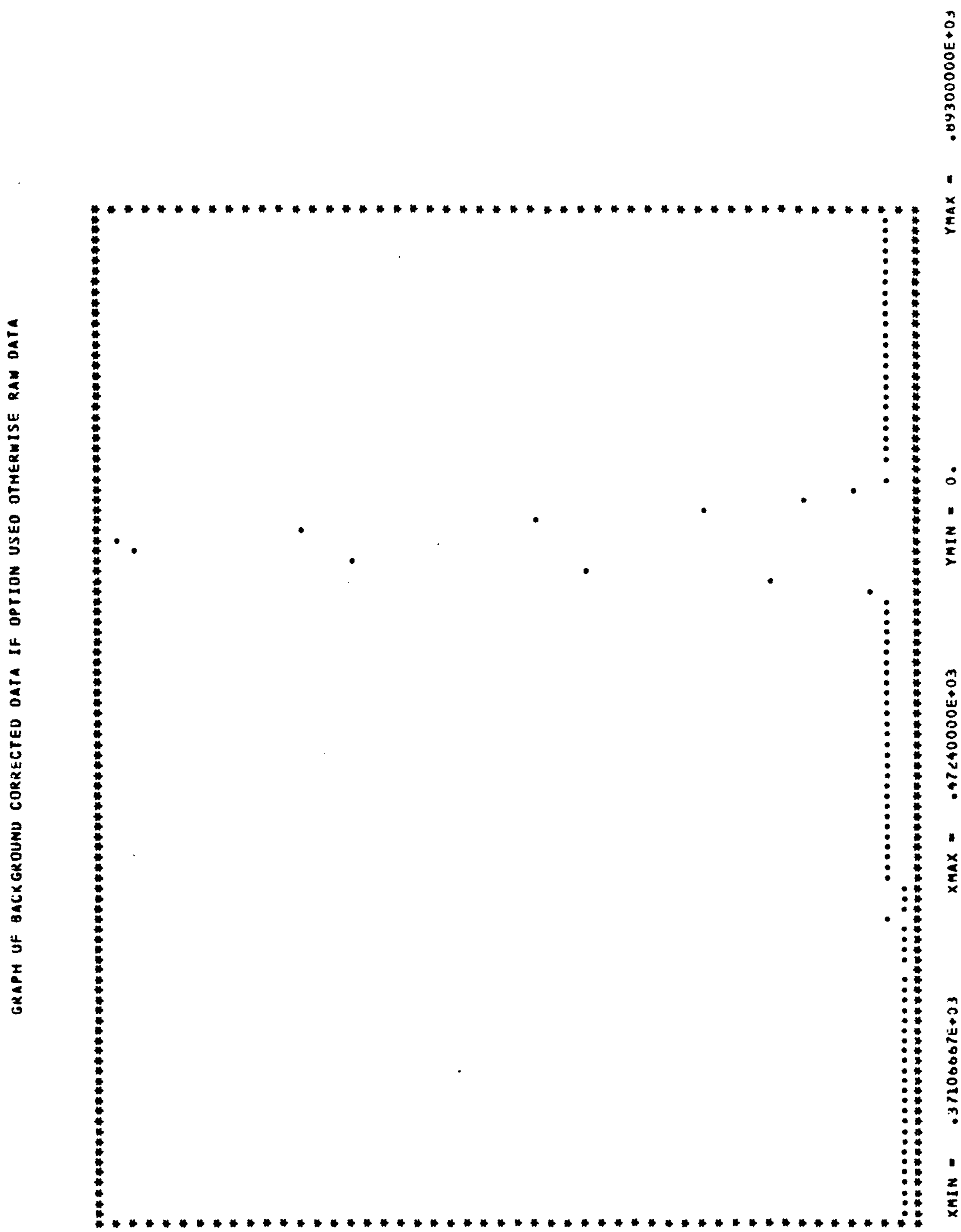
TEMPERATURE OF FIRST POINT OF DATA = 371.067 (DEG KELVIN)

PEAK BEGINS AT 434.00 DEG. K. (PEAK HEIGHT = 12.94)
PEAK ENDS AT 446.80 DEG. K. (PEAK HEIGHT = 16.92)

AREA-HEAT CONSTANT = .00090099 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .27145 DEG. K.-SEC./MILLICAL

TM= 436.10 DEG. K.


GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
XMIN = .3710667E+03
XMAX = .4724000E+03
YMIN = 0.
YMAX = .8930000E+03

81.10.7.3 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 9.100

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 371.067 (DEG KELVIN)

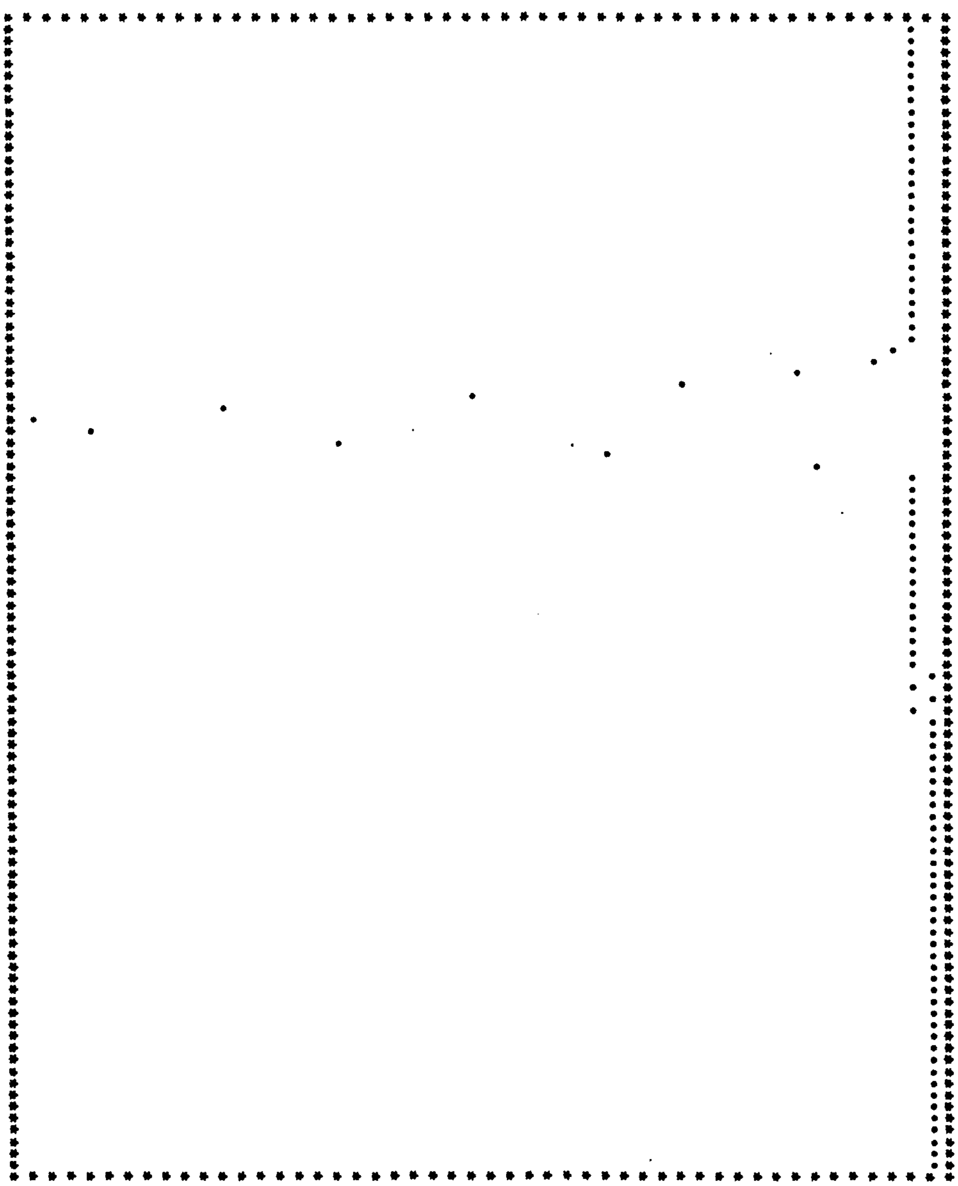
PEAK BEGINS AT 434.30 DEG. K. (PEAK HEIGHT = 12.67)
PEAK ENDS AT 446.80 DEG. K. (PEAK HEIGHT = 16.13)

AREA-HEAT CONSTANT = .00090140 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .27790 DEG. K.-SEC./MILLICAL

TM= 435.92 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



XMIN = .37106667E+03 XMAX = .47666667E+03 YMIN = 0. YMAX = .90800000E+03

81.10.7.4 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 9.100

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

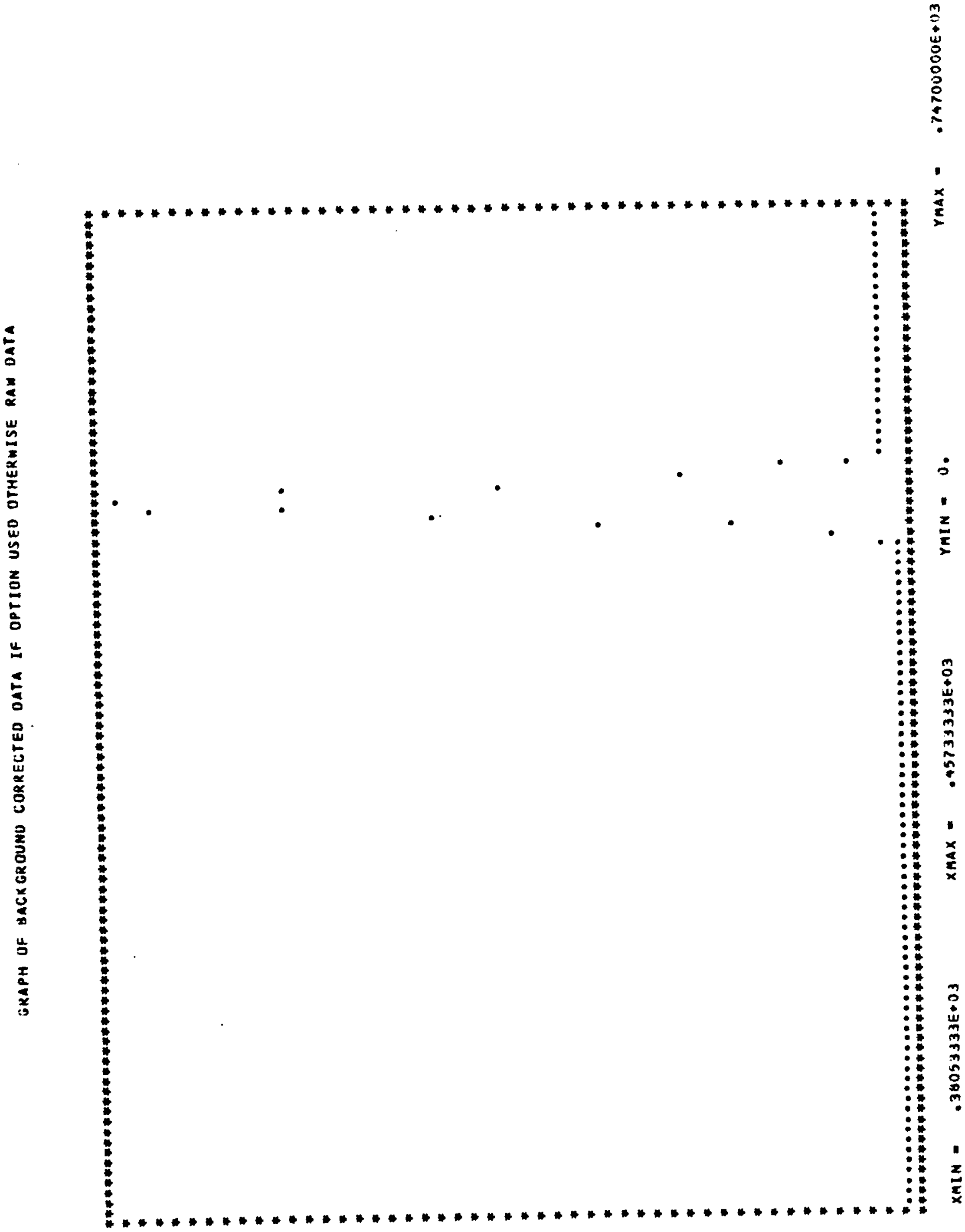
TEMPERATURE OF FIRST POINT OF DATA = 380.533 (DEG KELVIN)

PEAK BEGINS AT 431.73 DEG. K. (PEAK HEIGHT = 7.35)
PEAK ENDS AT 439.20 DEG. K. (PEAK HEIGHT = 10.65)

AREA-HEAT CONSTANT = .00091008 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .20875 DEG. K.-SEC./MILLICAL

TM= 433.20 DEG. K.


GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
XMIN = .38053333E+03
XMAX = .45733333E+03
YMIN = 0.
YMAX = .74700000E+03

81.10.7.5 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 9.100

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 380.533 (DEG KELVIN)

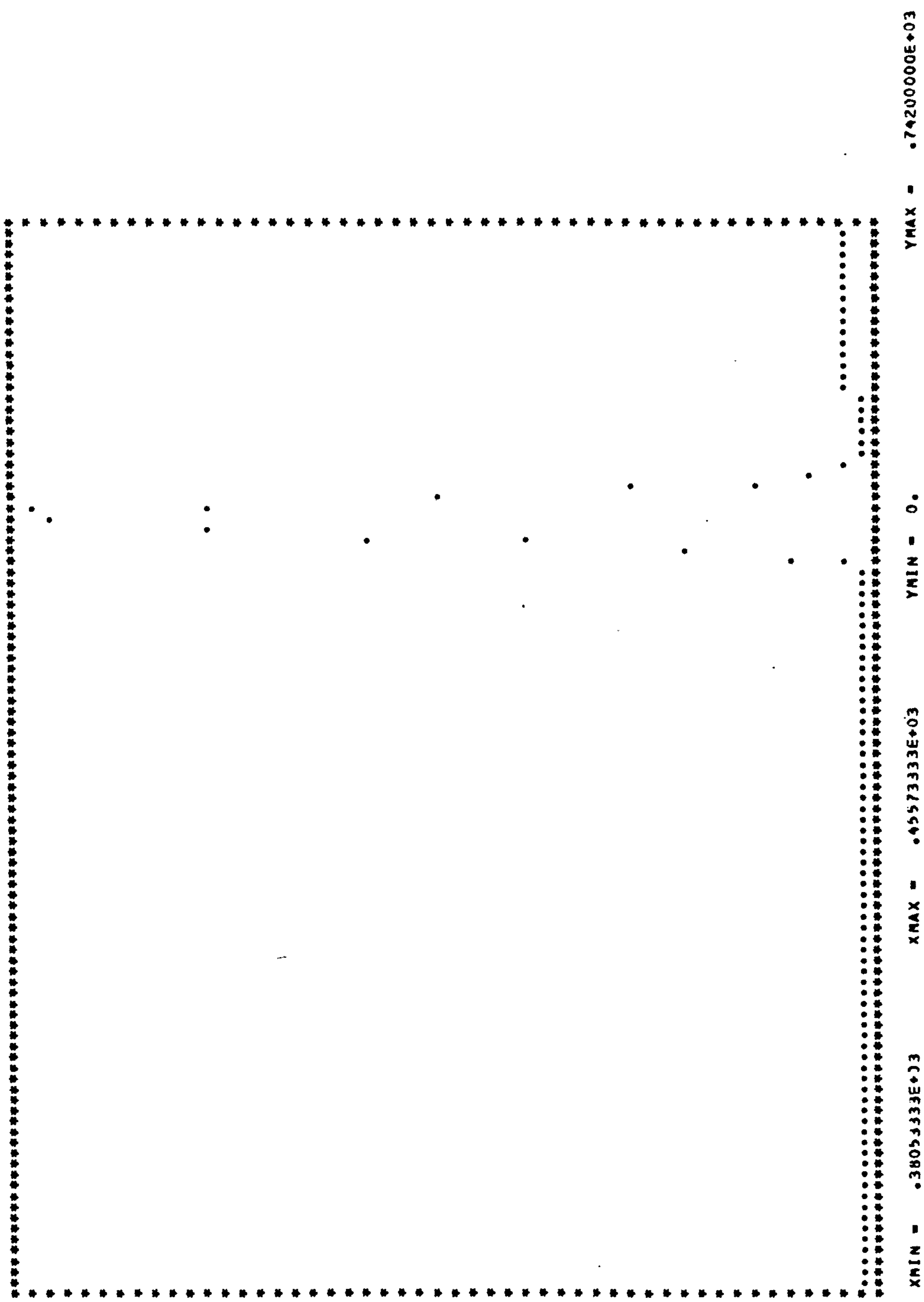
PEAK BEGINS AT 431.73 DEG. K. (PEAK HEIGHT = 6.80)
PEAK ENDS AT 439.20 DEG. K. (PEAK HEIGHT = 7.82)

AREA-HEAT CONSTANT = .00090879 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .21030 DEG. K.-SEC./MILLICAL

TM= 433.19 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



81.10.7.6 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 9.100

RANGE = 10.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 20.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

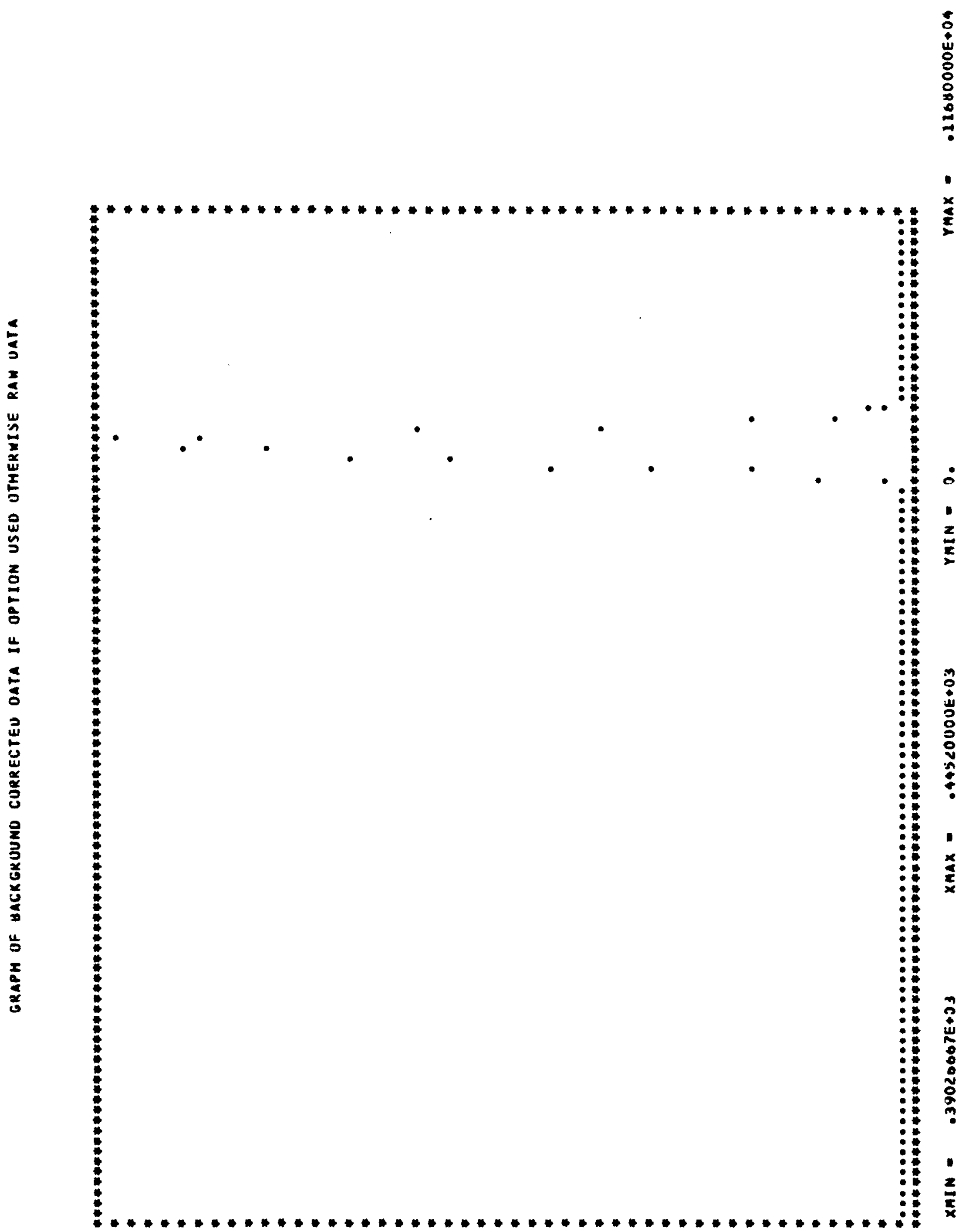
TEMPERATURE OF FIRST POINT OF DATA = 390.267 (DEG KELVIN)

PEAK BEGINS AT 430.27 DEG. K. (PEAK HEIGHT = 6.97)
PEAK ENDS AT 435.07 DEG. K. (PEAK HEIGHT = 5.07)

AREA-HEAT CONSTANT = .00091680 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .20122 DEG. K.-SEC./MILLICAL

TM= 431.06 DEG. K.


GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
XMIN = .39026667E+03
XMAX = .44520000E+03
YMIN = 0.
YMAX = .11680000E+04

81.10.7.7 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 9.100

RANGE = 10.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 20.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 390.267 (DEG KELVIN)

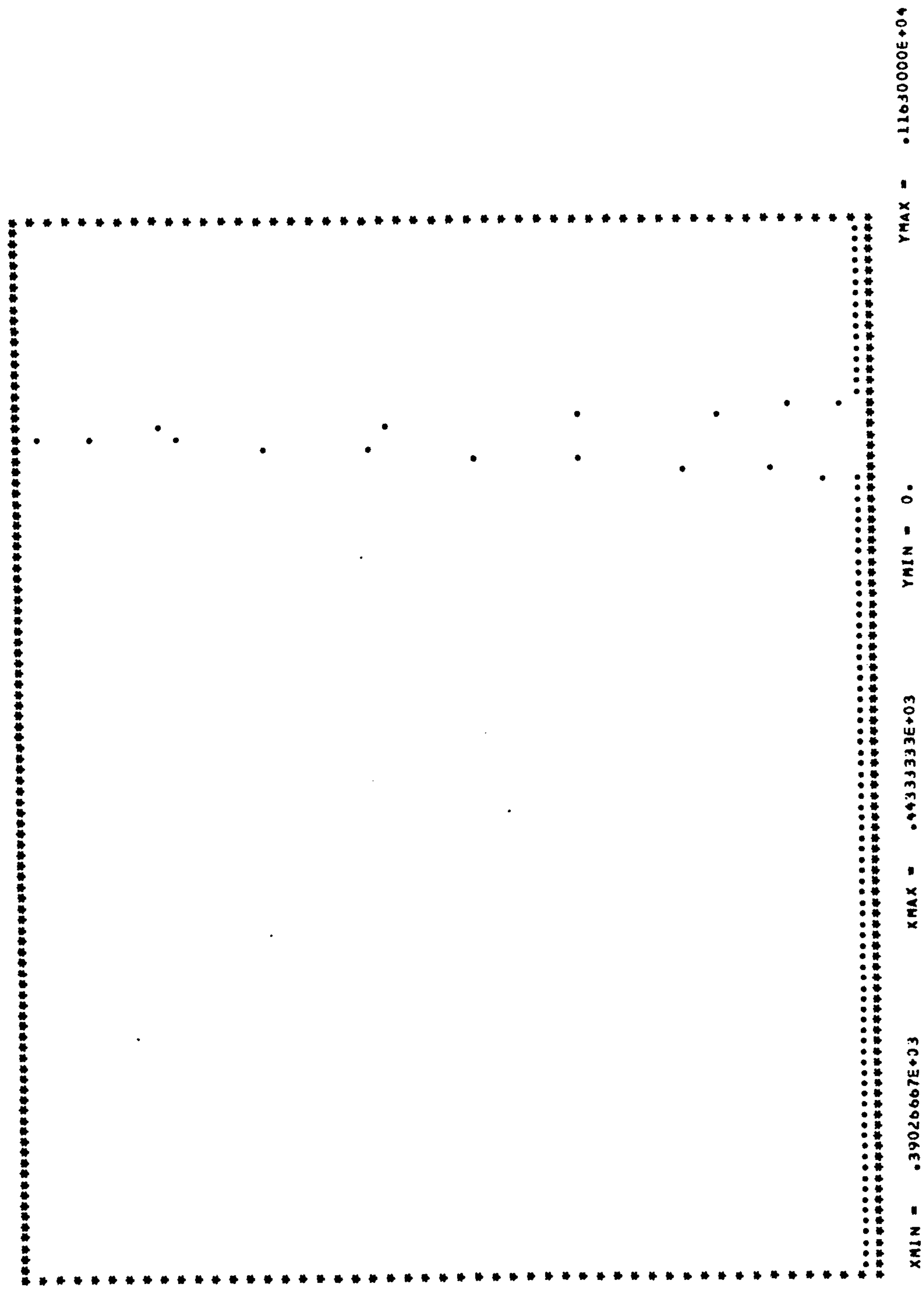
PEAK BEGINS AT 430.27 DEG. K. (PEAK HEIGHT = 4.17)
PEAK ENDS AT 435.07 DEG. K. (PEAK HEIGHT = 4.01)

AREA-HEAT CONSTANT = .00091671 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .20074 DEG. K.-SEC./MILLICAL

TM= 431.07 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



81.10.7.8 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 9.100

RANGE = 10.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 10.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

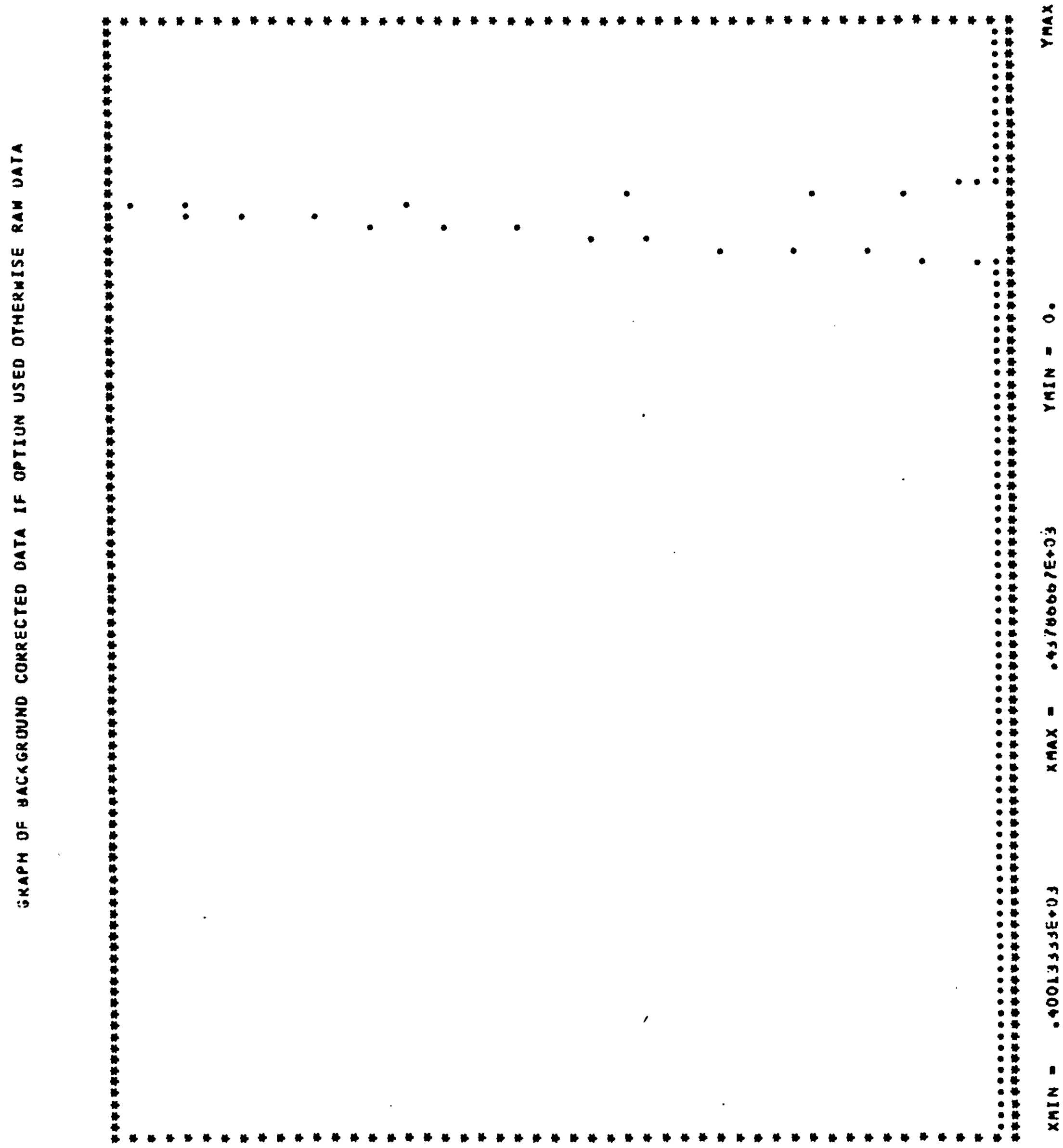
TEMPERATURE OF FIRST POINT OF DATA = 400.133 (DEG KELVIN)

PEAK BEGINS AT 430.13 DEG. K. (PEAK HEIGHT = 1.04)
PEAK ENDS AT 432.80 DEG. K. (PEAK HEIGHT = 2.57)

AREA-HEAT CONSTANT = .00092041 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .20141 DEG. K.-SEC./MILLICAL

TM= 430.24 DEG. K.


GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
XMIN = .40013333E+03
XMAX = .45786667E+03
YMIN = 0.
YMAX = .88100000E+03

81.10.7.9 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 9.100

RANGE = 5.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 5.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 410.067 (DEG KELVIN)

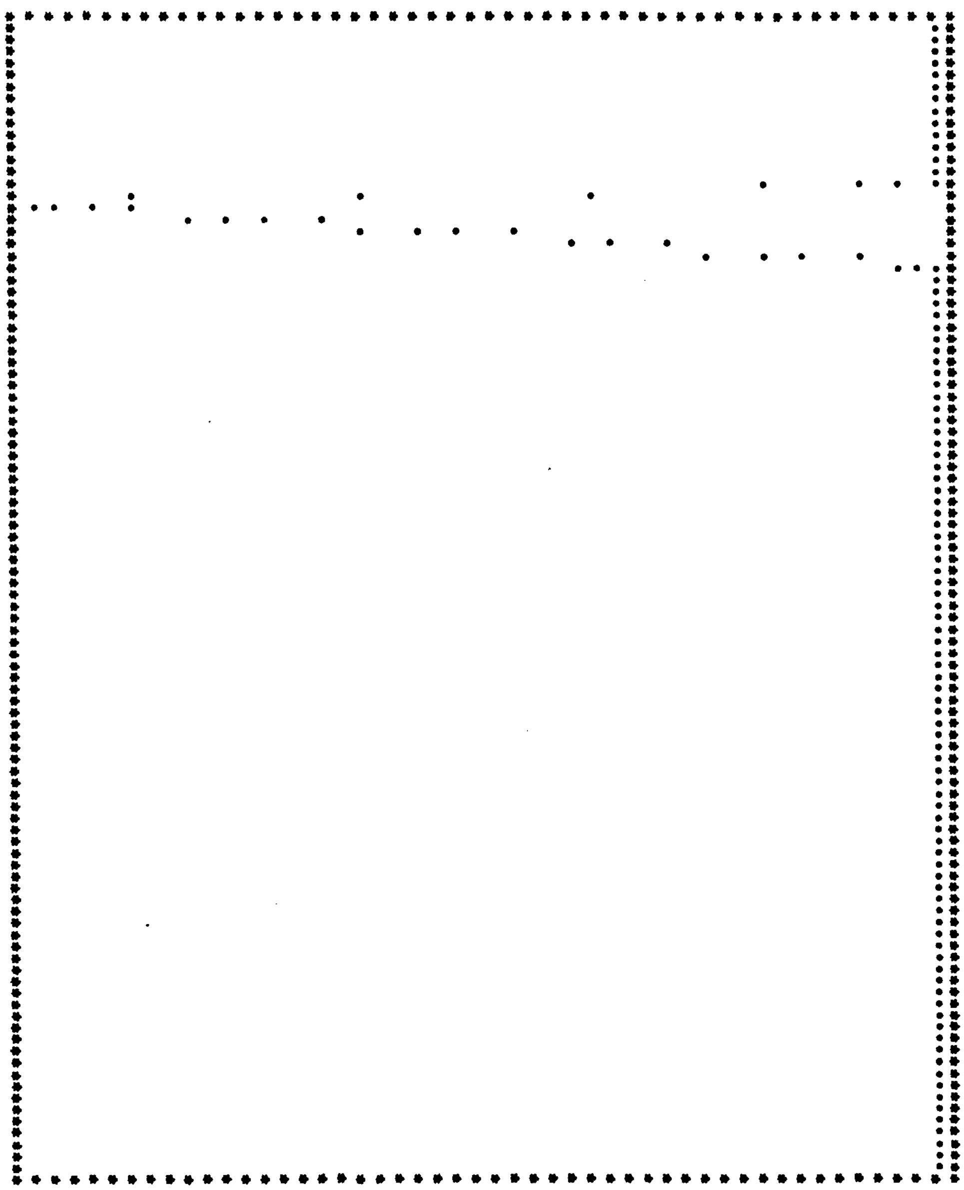
PEAK BEGINS AT 429.47 DEG. K. (PEAK HEIGHT = 5.81)
PEAK ENDS AT 431.33 DEG. K. (PEAK HEIGHT = 4.85)

AREA-HEAT CONSTANT = .00092688 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .19850 DEG. K.-SEC./MILLICAL

TM= 429.69 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



XMIN = .41006667E+03 XMAX = .43453333E+03 YMIN = 0. YMAX = .12880000E+04

81.10.7.10 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 5.000

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 371.067 (DEG KELVIN)

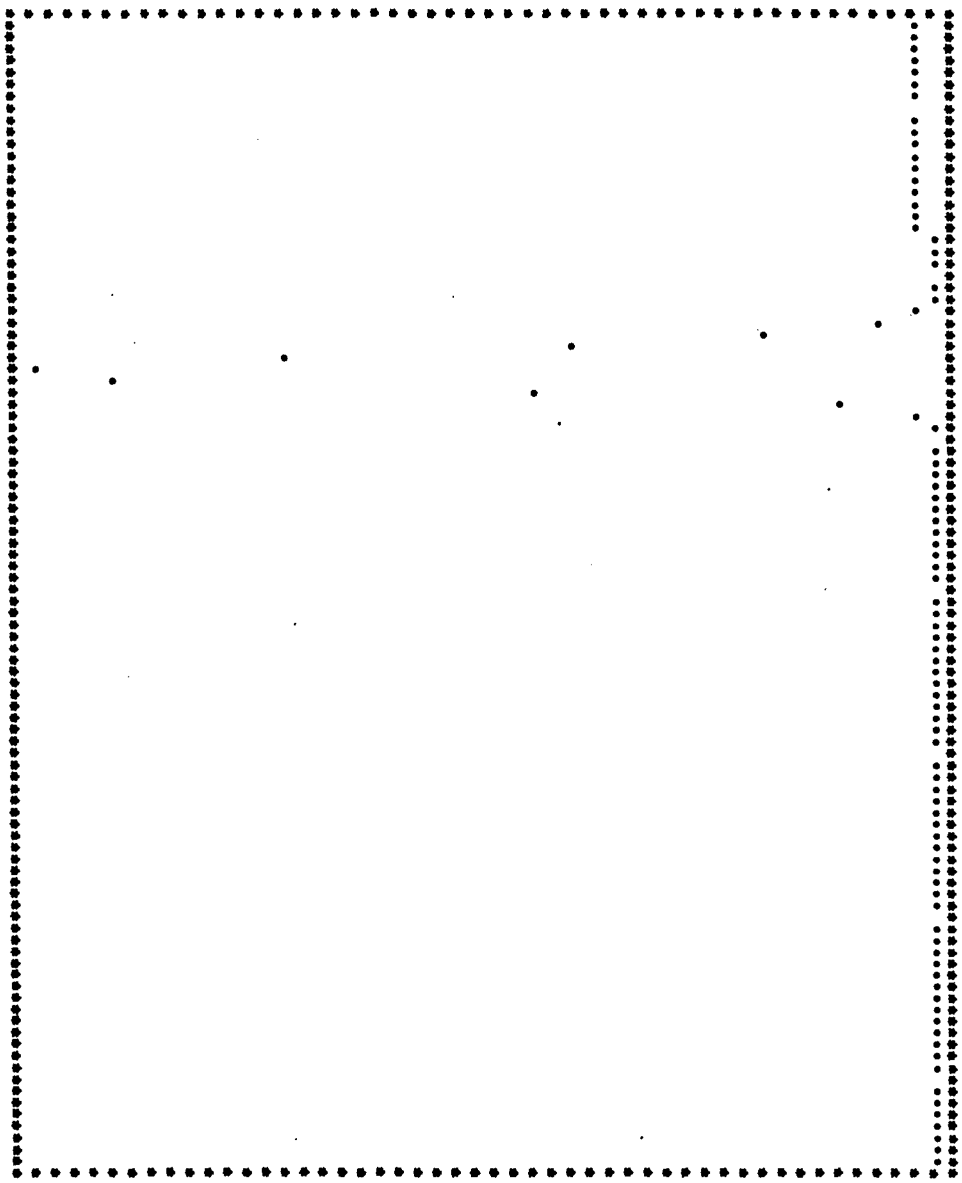
PEAK BEGINS AT 432.93 DEG. K. (PEAK HEIGHT = 5.30)
PEAK ENDS AT 443.60 DEG. K. (PEAK HEIGHT = 4.82)

AREA-HEAT CONSTANT = .00090978 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .34373 DEG. K.-SEC./MILLICAL

TM= 434.46 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



XMIN = .37106667E+03 XMAX = .46706667E+03 YMIN = 0. YMAX = .61400000E+03

81.10.7.11 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 5.000

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

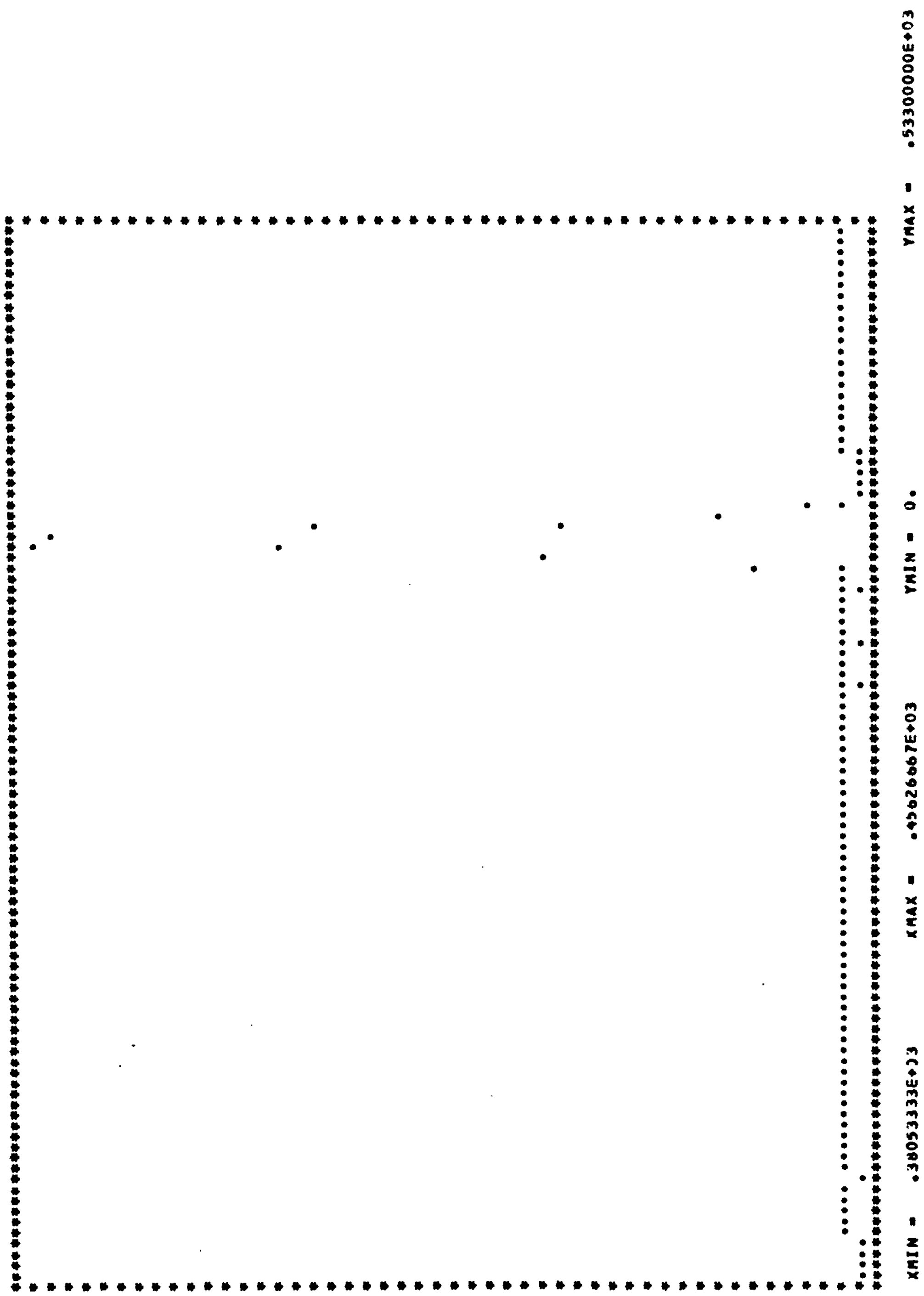
TEMPERATURE OF FIRST POINT OF DATA = 380.533 (DEG KELVIN)

PEAK BEGINS AT 431.20 DEG. K. (PEAK HEIGHT = 6.23)
PEAK ENDS AT 436.53 DEG. K. (PEAK HEIGHT = 6.49)

AREA-HEAT CONSTANT = .00092576 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .21357 DEG. K.-SEC./MILLICAL

TM= 431.78 DEG. K.




GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

81.10.7.12 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 5.000

RANGE = 10.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 20.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

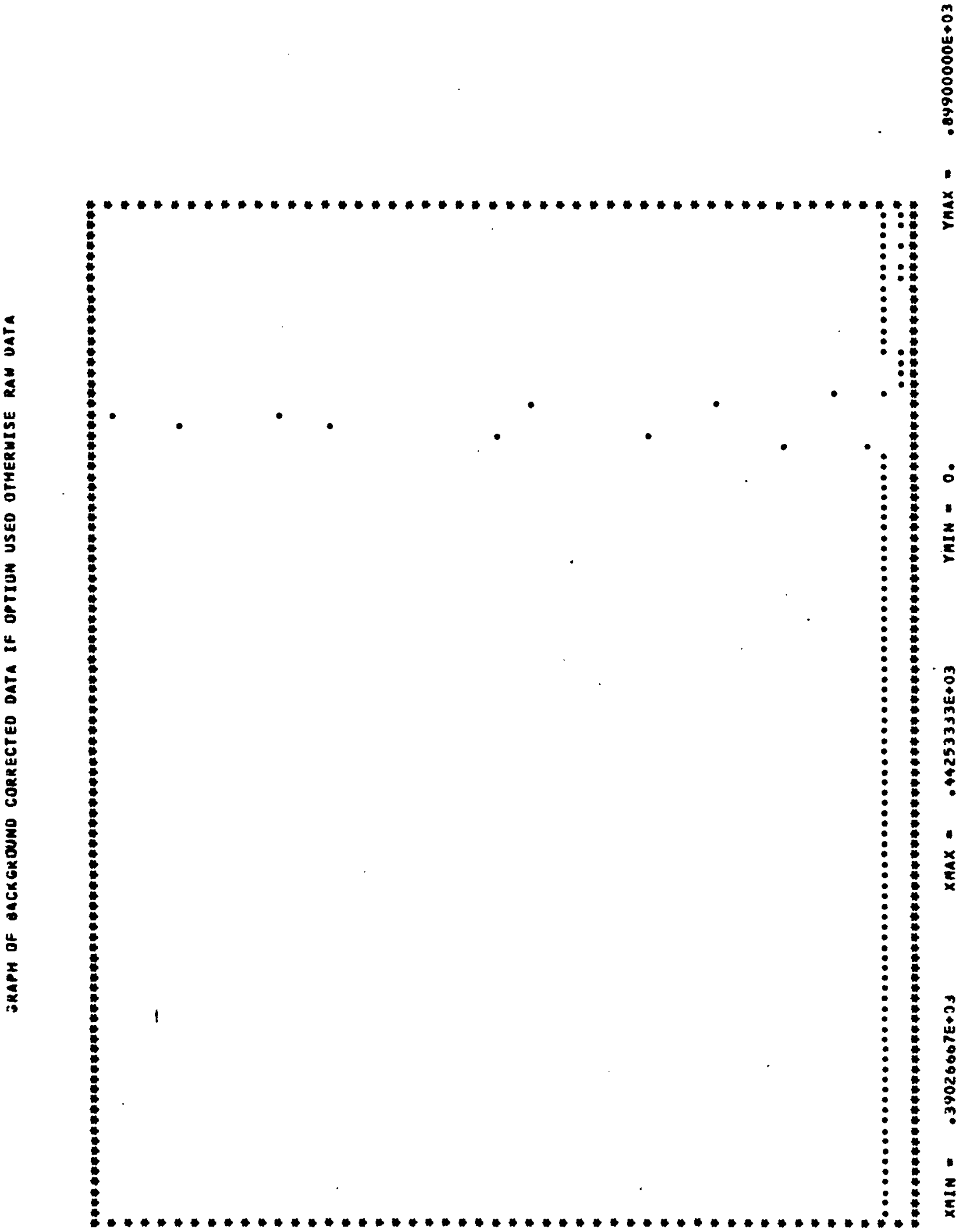
TEMPERATURE OF FIRST POINT OF DATA = 390.267 (DEG KELVIN)

PEAK BEGINS AT 430.27 DEG. K. (PEAK HEIGHT = 10.97)
PEAK ENDS AT 433.47 DEG. K. (PEAK HEIGHT = 8.55)

AREA-HEAT CONSTANT = .00092508 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .16122 DEG. K.-SEC./MILLICAL

TM= 430.81 DEG. K.


GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
XMIN = .39026667E+03
XMAX = .44253333E+03
YMIN = 0.
YMAX = .8490000E+03

81.10.7.13 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 5.000

RANGE = 10.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 10.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 410.133 (DEG KELVIN)

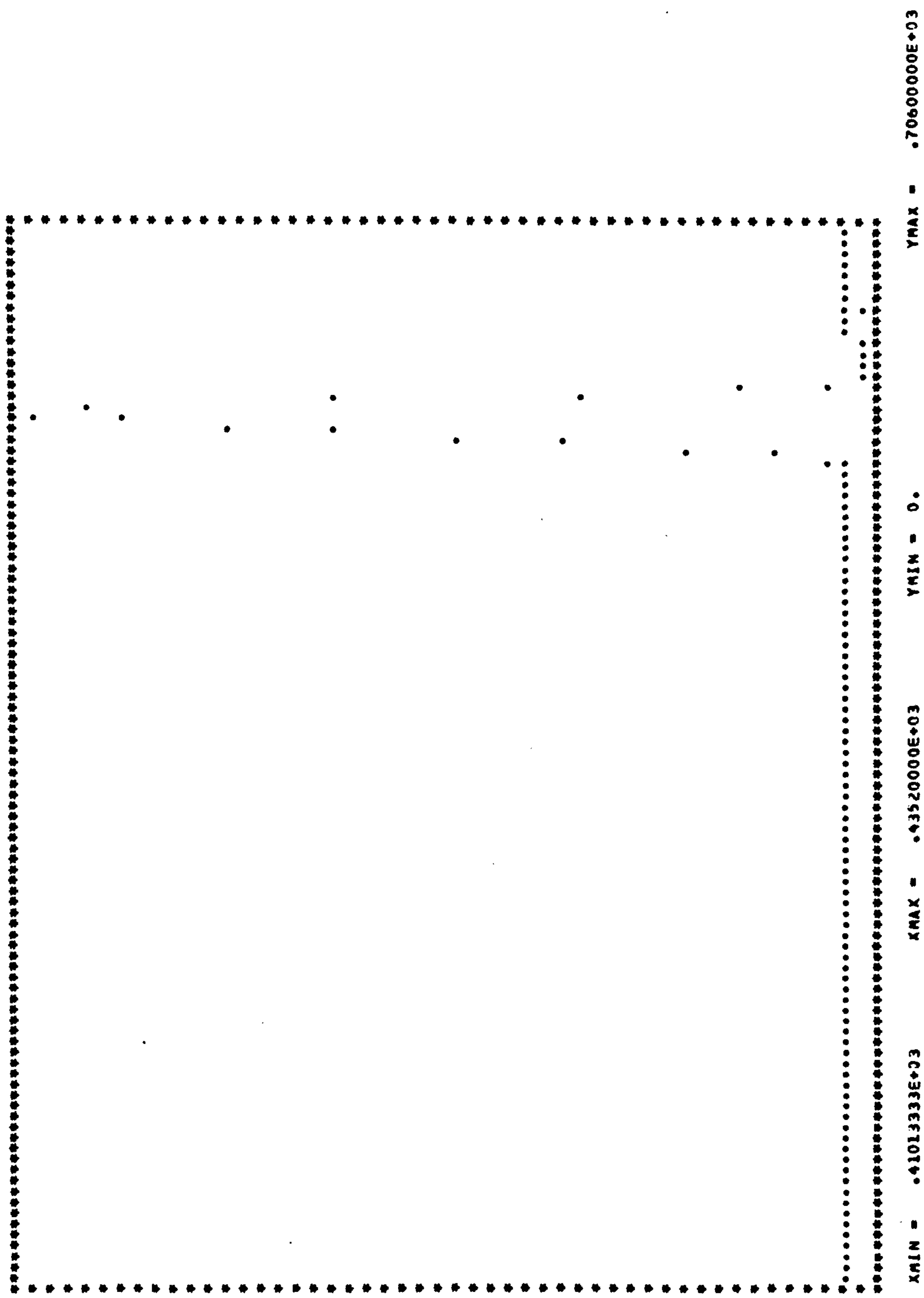
PEAK BEGINS AT 429.87 DEG. K. (PEAK HEIGHT = 9.15)
PEAK ENDS AT 431.73 DEG. K. (PEAK HEIGHT = 4.38)

AREA-HEAT CONSTANT = .00092816 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .14388 DEG. K.-SEC./MILLICAL

TM= 430.00 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



81.10.7.14 INDIUM

HEAT OF FUSION (CAL/GRAM) = 6.800

WEIGHT (MG) OF CALIBRATION STANDARD = 5.000

RANGE = 5.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 5.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 420.067 (DEG KELVIN)

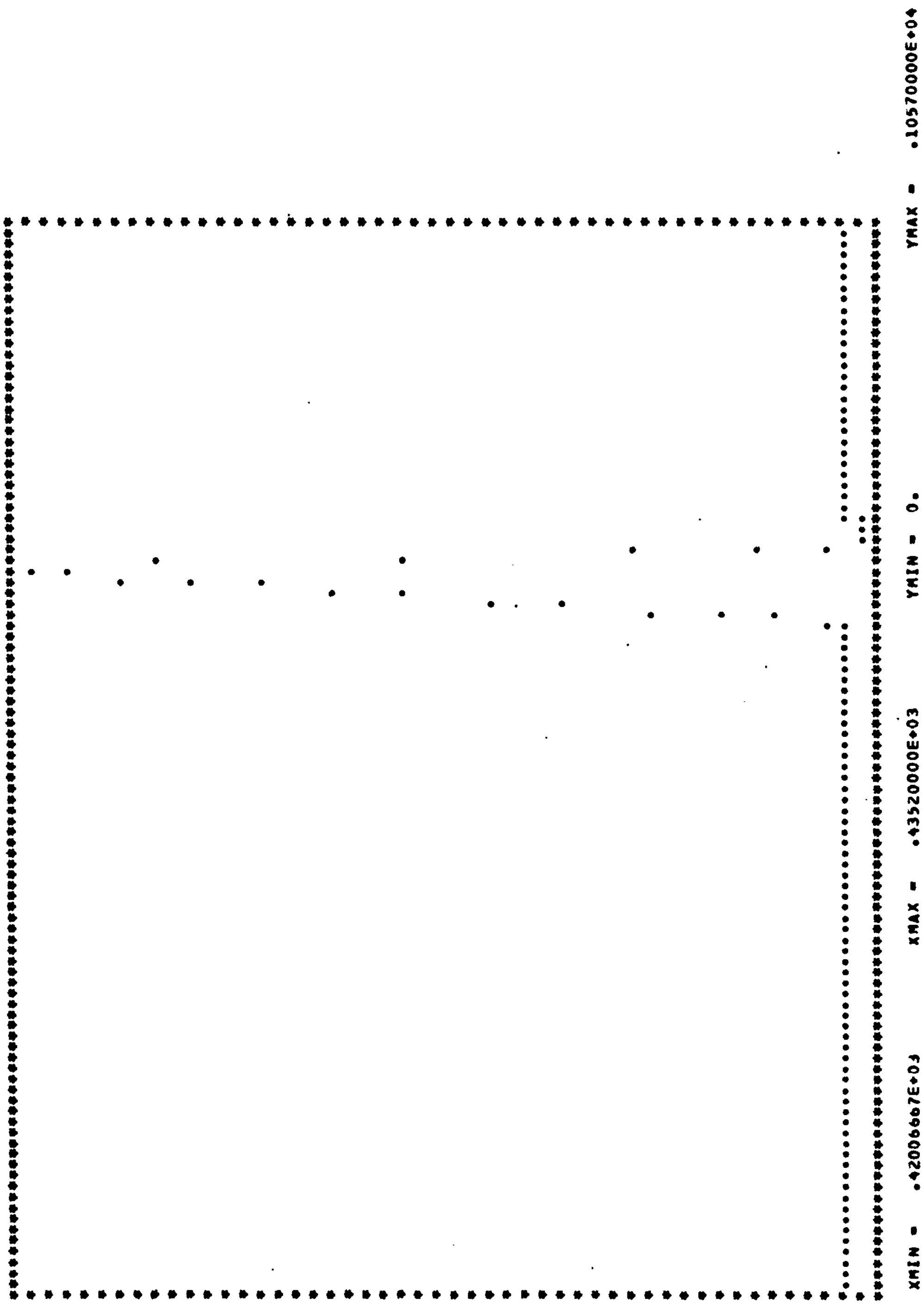
PEAK BEGINS AT 429.60 DEG. K. (PEAK HEIGHT = 16.77)
PEAK ENDS AT 430.80 DEG. K. (PEAK HEIGHT = 12.28)

AREA-HEAT CONSTANT = .00093993 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .14136 DEG. K.-SEC./MILLICAL

TM= 429.71 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



81.10.7.15 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 4.900

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 541.067 (DEG KELVIN)

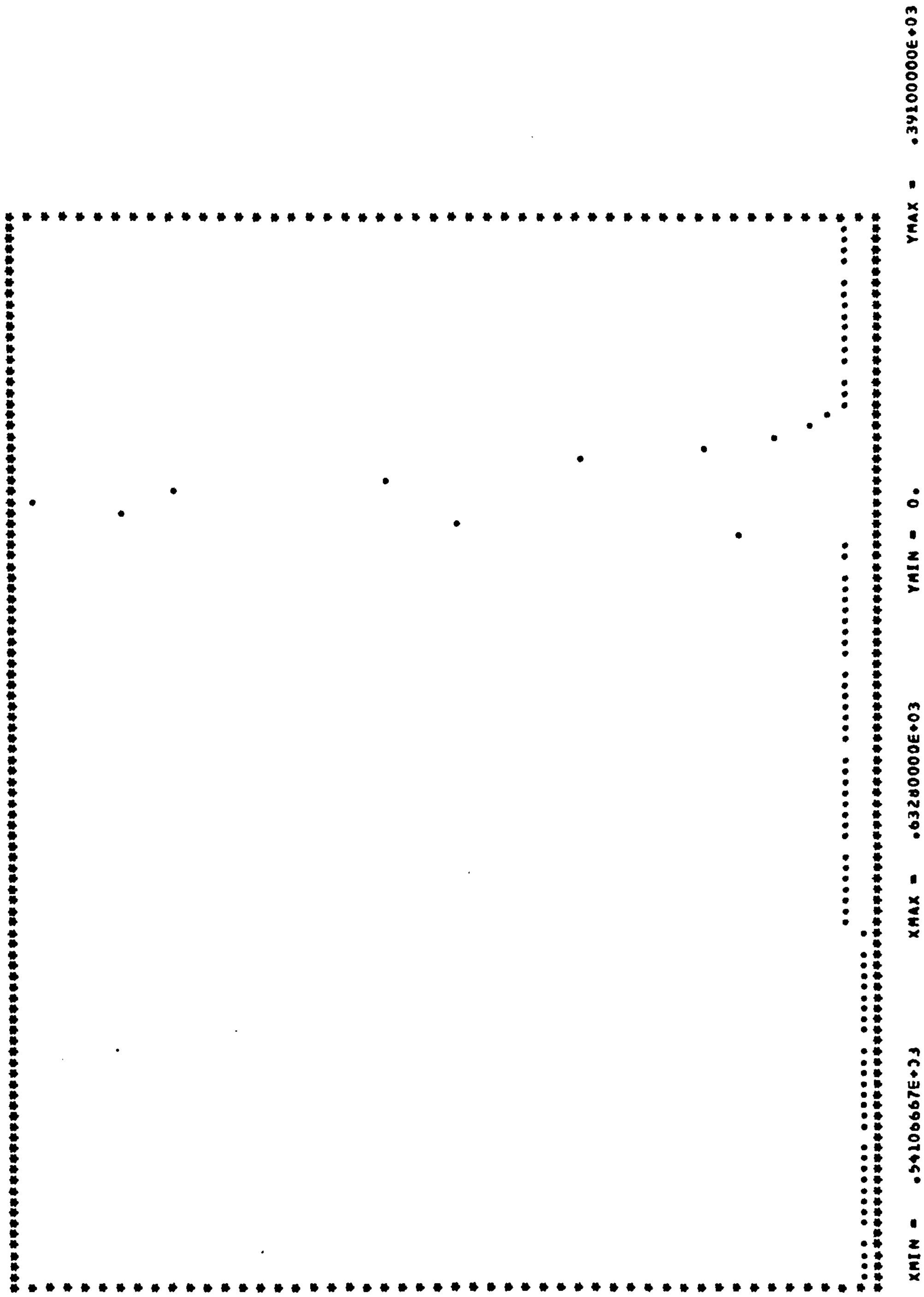
PEAK BEGINS AT 604.00 DEG. K. (PEAK HEIGHT = 8.19)
PEAK ENDS AT 614.67 DEG. K. (PEAK HEIGHT = 20.33)

AREA-HEAT CONSTANT = .00103078 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .49757 DEG. K.-SEC./MILLICAL

TM= 605.47 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



81.10.7.16 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 4.900

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 541.067 (DEG KELVIN)

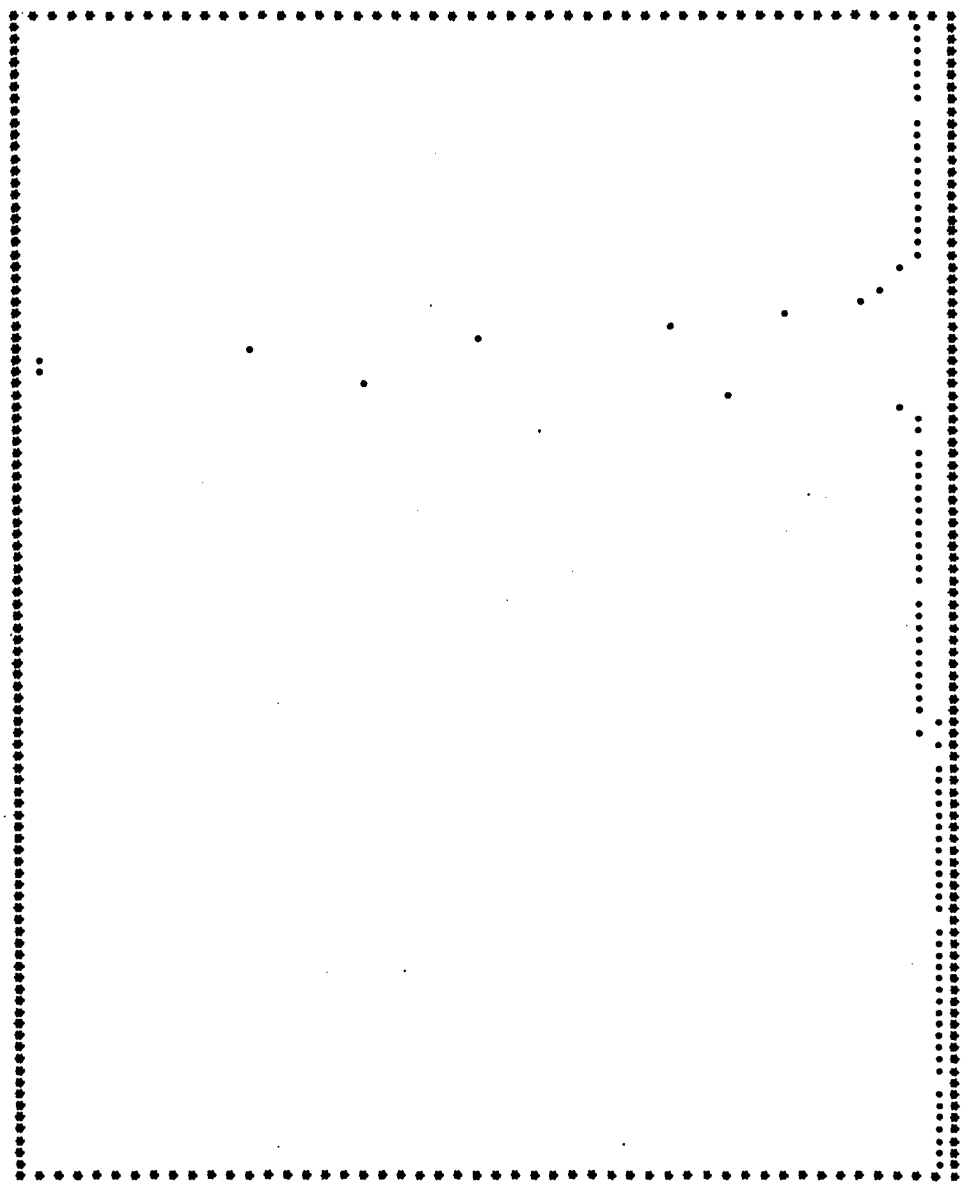
PEAK BEGINS AT 604.00 DEG. K. (PEAK HEIGHT = 7.30)
PEAK ENDS AT 614.67 DEG. K. (PEAK HEIGHT = 16.91)

AREA-HEAT CONSTANT = .00100984 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .52374 DEG. K.-SEC./MILLICAL

TM= 605.44 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



XMIN = .54106667E+03    XMAX = .63706667E+03    YMIN = 0.    YMAX = .38000000E+03

81.10.7.17 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 4.900

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 560.533 (DEG KELVIN)

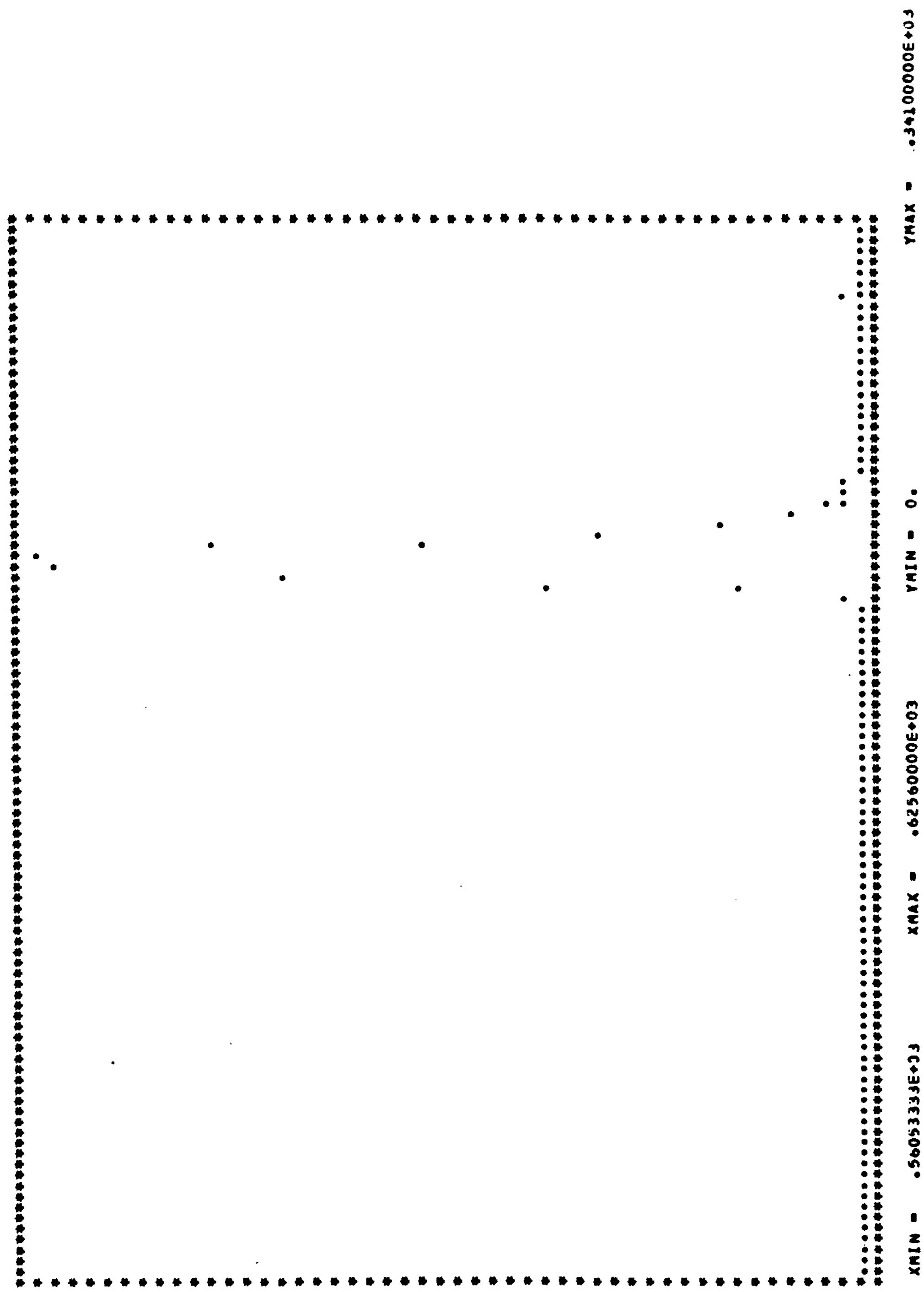
PEAK BEGINS AT 602.67 DEG. K. (PEAK HEIGHT = 2.78)
PEAK ENDS AT 608.00 DEG. K. (PEAK HEIGHT = 7.82)

AREA-HEAT CONSTANT = .00130783 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .31389 DEG. K.-SEC./MILLICAL

TM= 603.21 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



81.10.7.18 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 4.900

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 560.533 (DEG KELVIN)

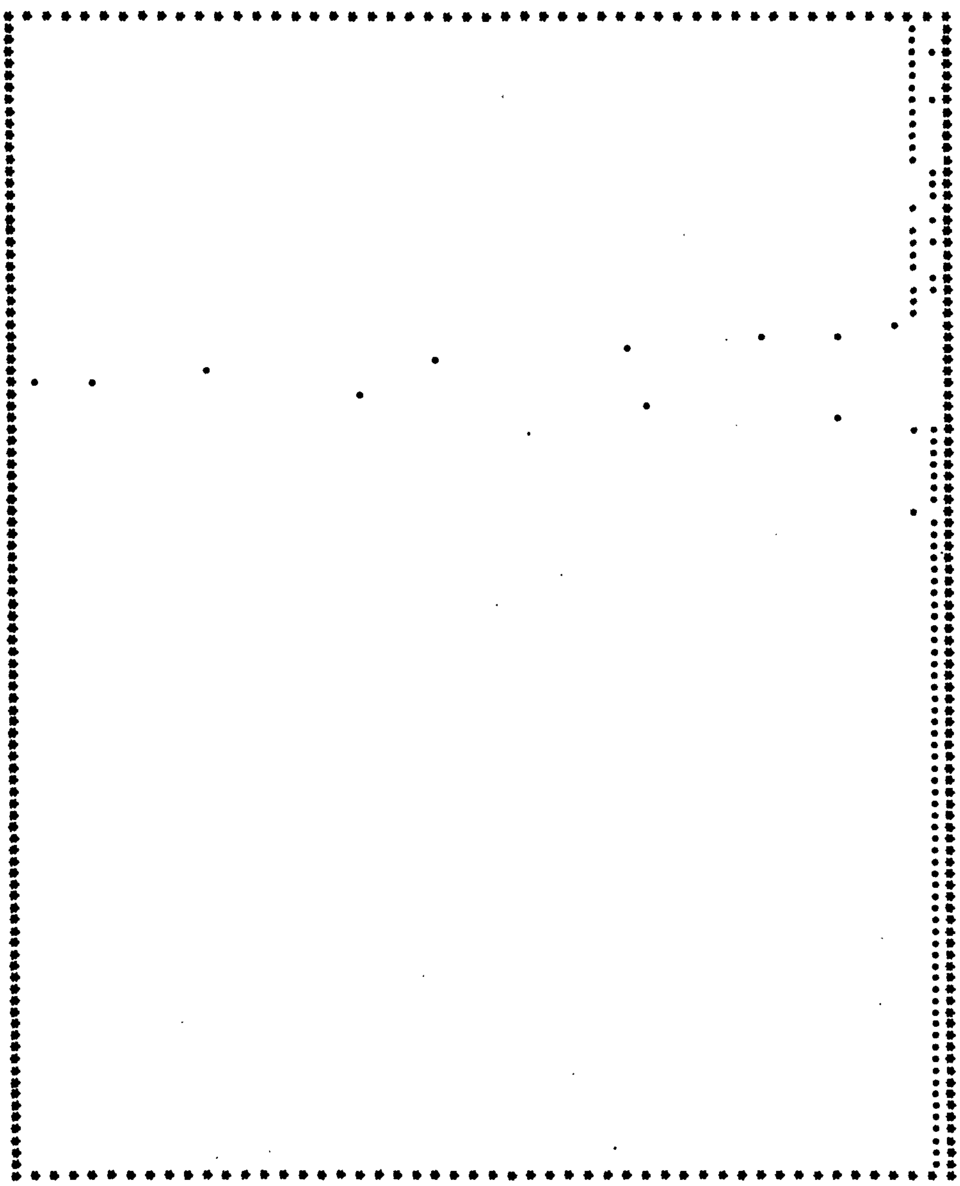
PEAK BEGINS AT 602.67 DEG. K. (PEAK HEIGHT = 3.41)
PEAK ENDS AT 608.00 DEG. K. (PEAK HEIGHT = 9.27)

AREA-HEAT CONSTANT = .00101127 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .31919 DEG. K.-SEC./MILLICAL

TM= 603.13 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



XMIN = .56053333E+03 XMAX = .62506667E+03 YMIN = 0. YMAX = .3480000E+03

81.10.7.19 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 4.900

RANGE = 10.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 20.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 580.267 (DEG KELVIN)

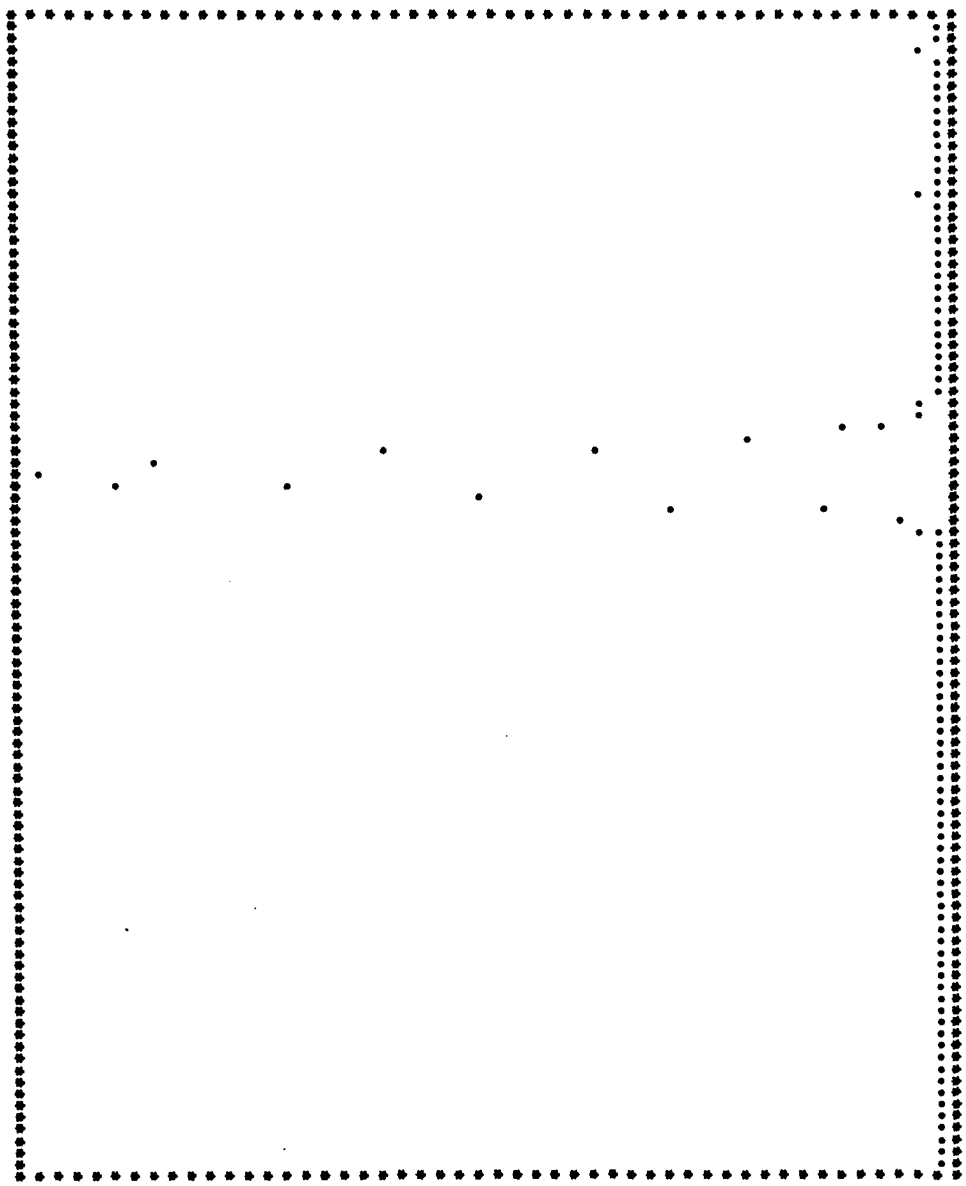
PEAK BEGINS AT 601.60 DEG. K. (PEAK HEIGHT = 5.93)
PEAK ENDS AT 604.80 DEG. K. (PEAK HEIGHT = 9.30)

AREA-HEAT CONSTANT = .00099521 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .22666 DEG. K.-SEC./MILLICAL

TM= 601.88 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



81.10.7.20 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 4.900

RANGE = 10.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 10.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

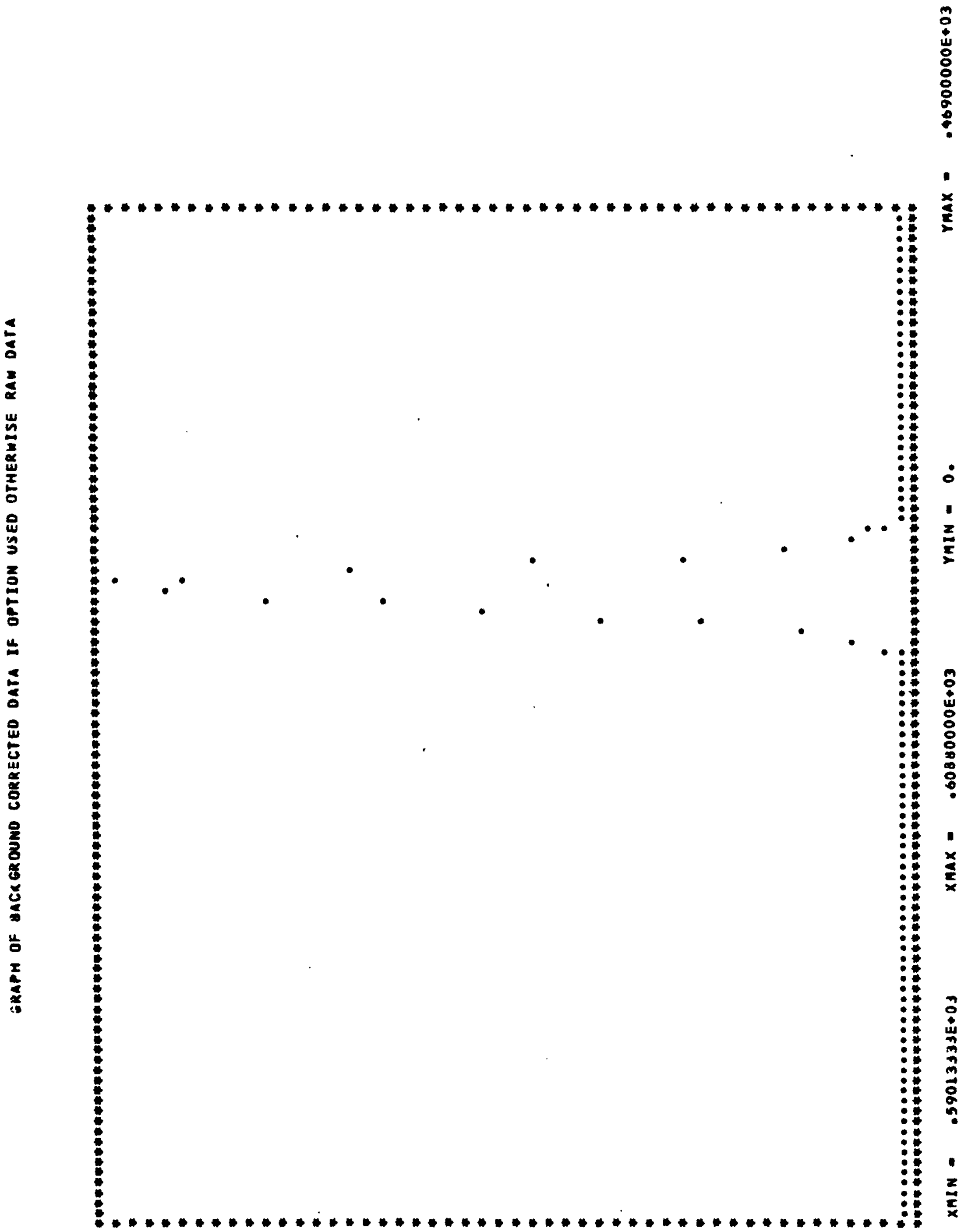
TEMPERATURE OF FIRST POINT OF DATA = 590.133 (DEG KELVIN)

PEAK BEGINS AT 600.93 DEG. K. (PEAK HEIGHT = 2.53)
PEAK ENDS AT 602.80 DEG. K. (PEAK HEIGHT = 6.32)

AREA-HEAT CONSTANT = .00100849 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .20023 DEG. K.-SEC./MILLICAL

TM= 601.06 DEG. K.


GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
XMIN = .5901333E+03
XMAX = .6080000E+03
YMIN = 0.
YMAX = .4690000E+03

81.10.7.21 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 4.900

RANGE = 5.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 5.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 595.067 (DEG KELVIN)

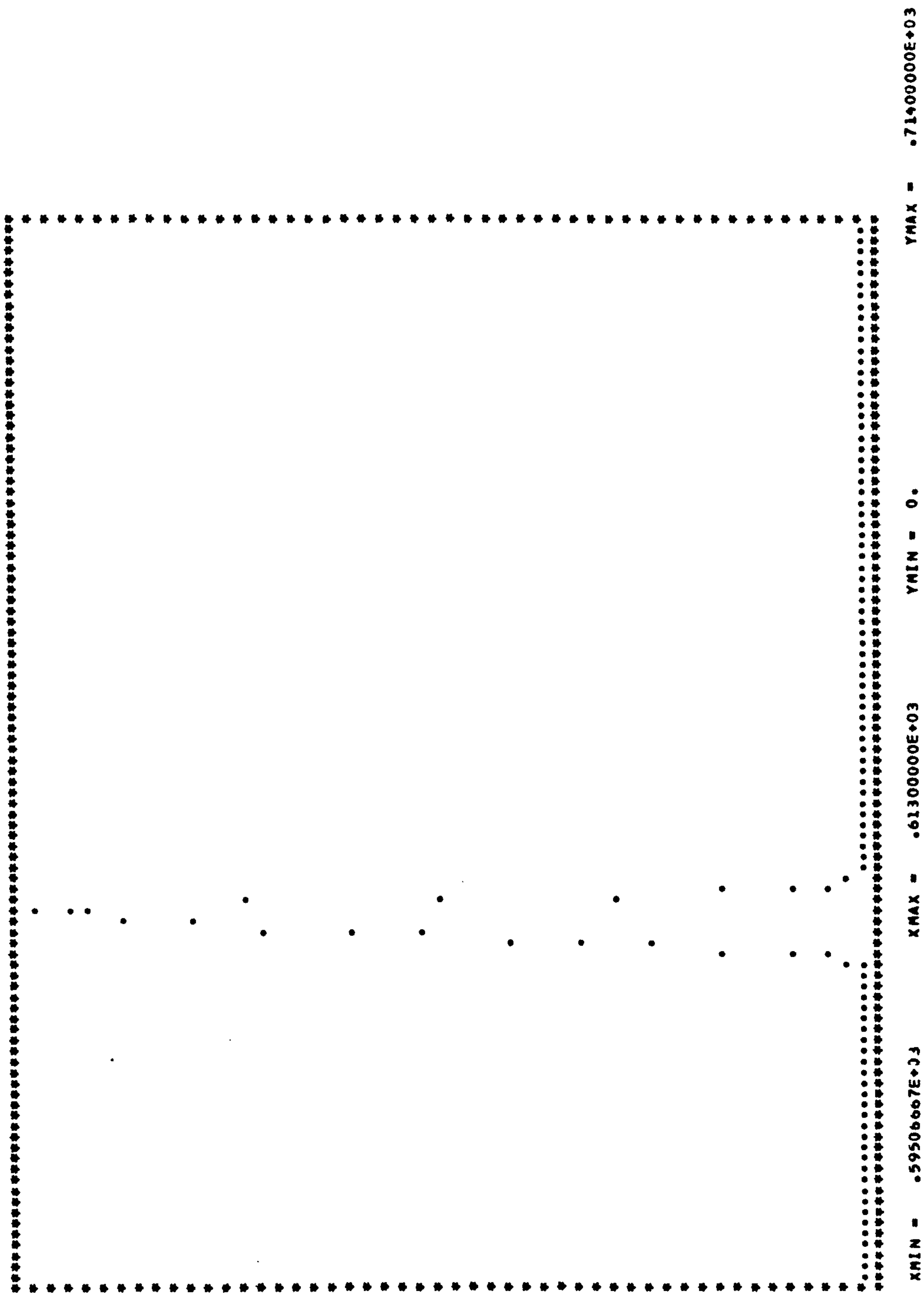
PEAK BEGINS AT 600.47 DEG. K. (PEAK HEIGHT = 6.42)
PEAK ENDS AT 601.80 DEG. K. (PEAK HEIGHT = 5.86)

AREA-HEAT CONSTANT = .00099615 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .19851 DEG. K.-SEC./MILLICAL

TM= 600.63 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



81.10.7.22 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 8.500

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 541.067 (DEG KELVIN)

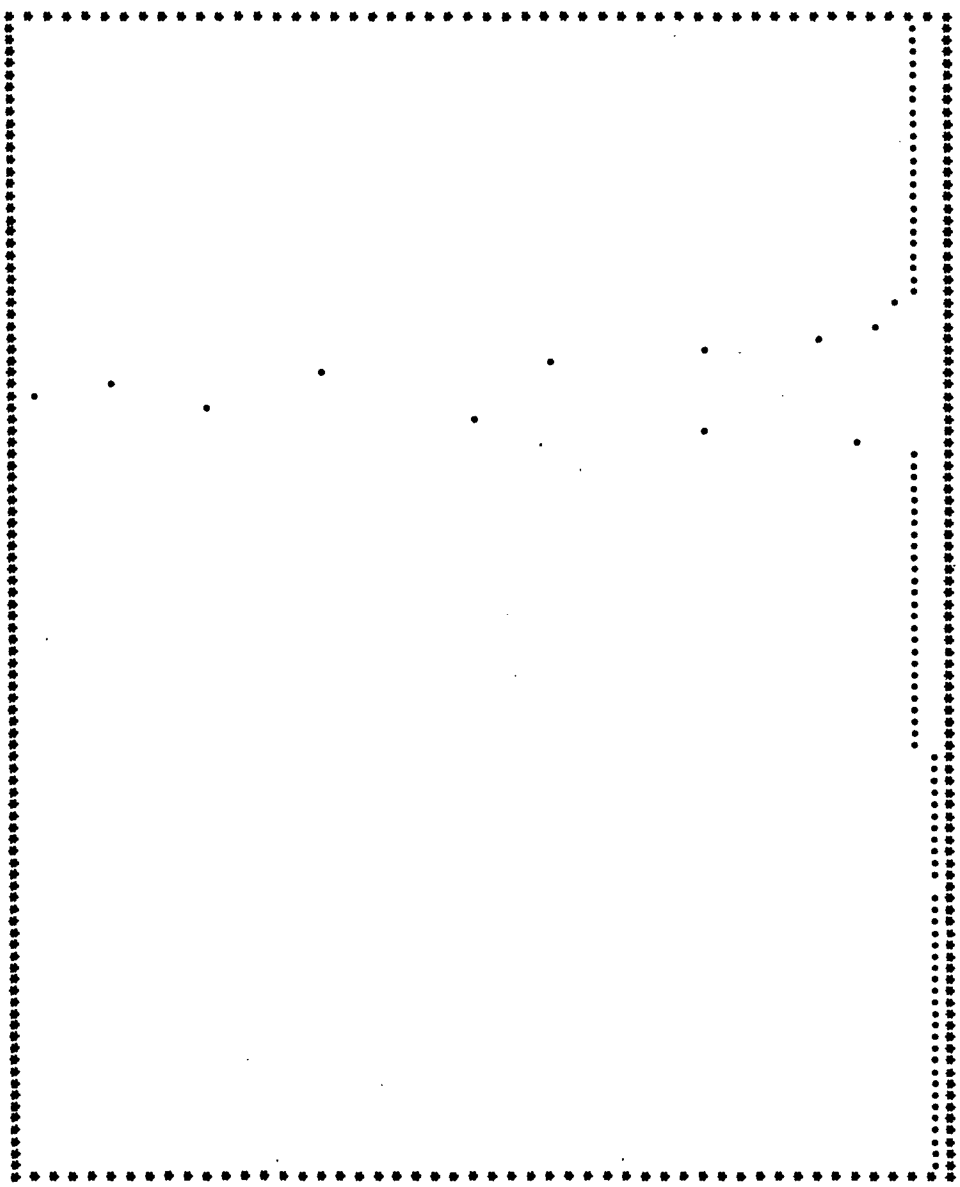
PEAK BEGINS AT 604.00 DEG. K. (PEAK HEIGHT = 11.53)
PEAK ENDS AT 616.80 DEG. K. (PEAK HEIGHT = 22.04)

AREA-HEAT CONSTANT = .00095532 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .37114 DEG. K.-SEC./MILLICAL

TM= 606.02 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



81.10.7.23 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.503

WEIGHT (MG) OF CALIBRATION STANDARD = 8.500

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 541.067 (DEG KELVIN)

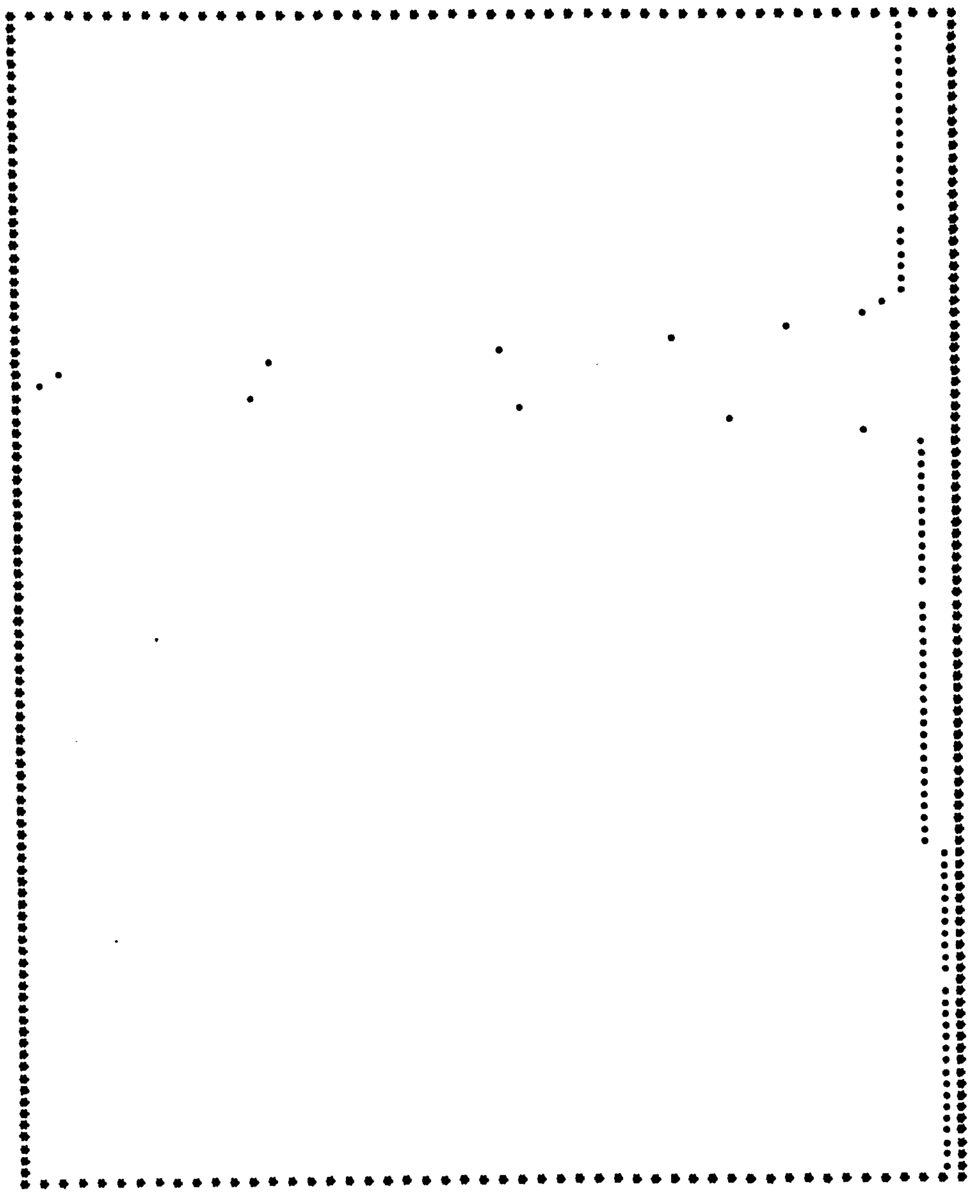
PEAK BEGINS AT 604.30 DEG. K. (PEAK HEIGHT = 14.58)
PEAK ENDS AT 616.80 DEG. K. (PEAK HEIGHT = 28.55)

AREA-HEAT CONSTANT = .00095949 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .37472 DEG. K.-SEC./MILLICAL

TM= 606.06 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



XMIN = .54106667E+03  XMAX = .64133333E+03  YMIN = 0.  YMAX = .62500000E+03

81.10.7.24 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 8.500

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 560.533 (DEG KELVIN)

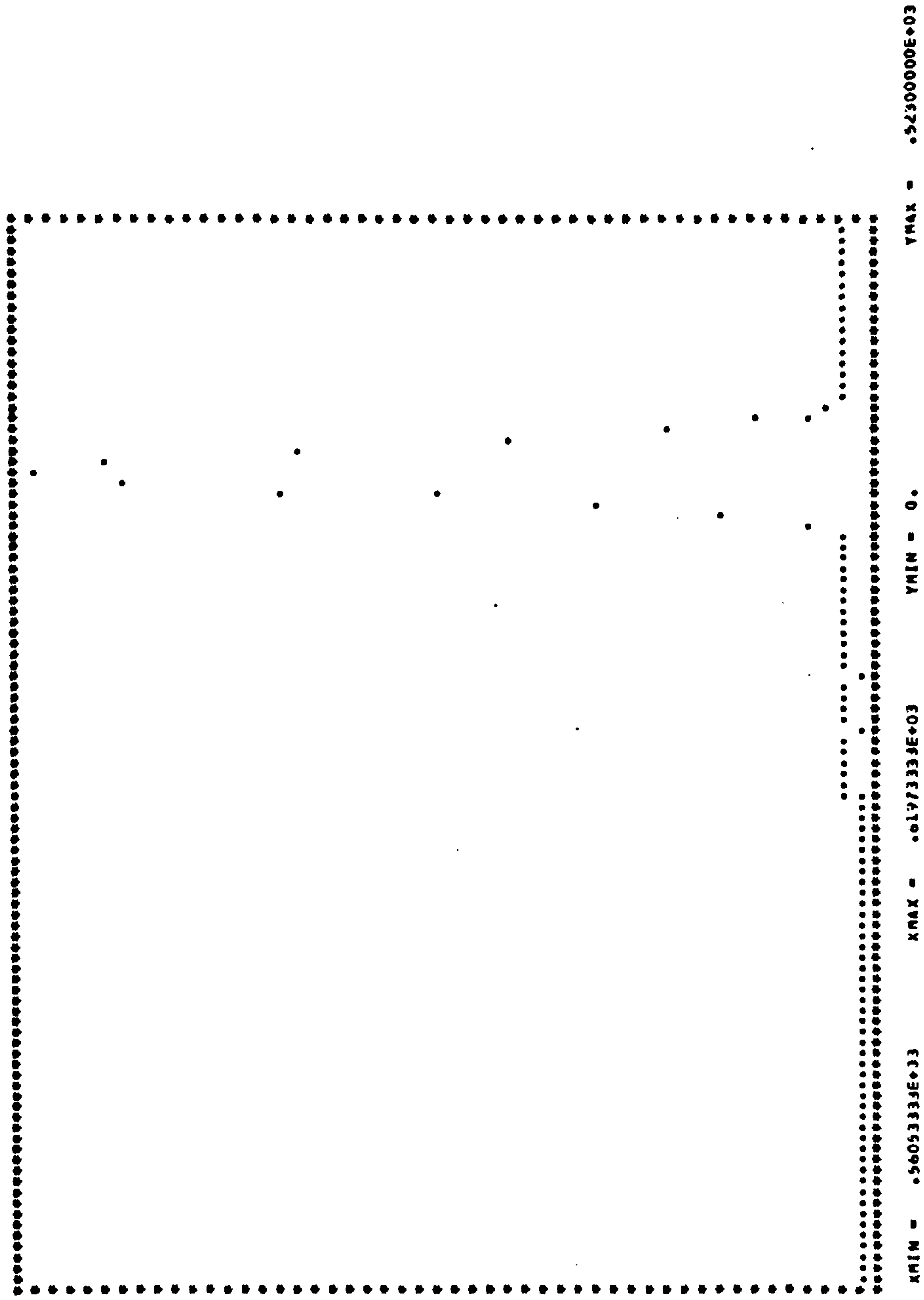
PEAK BEGINS AT 603.20 DEG. K. (PEAK HEIGHT = 8.93)
PEAK ENDS AT 609.60 DEG. K. (PEAK HEIGHT = 16.14)

AREA-HEAT CONSTANT = .00096786 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .29156 DEG. K.-SEC./MILLICAL

TM= 603.52 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA



81.10.7.25 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 8.500

RANGE = 20.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

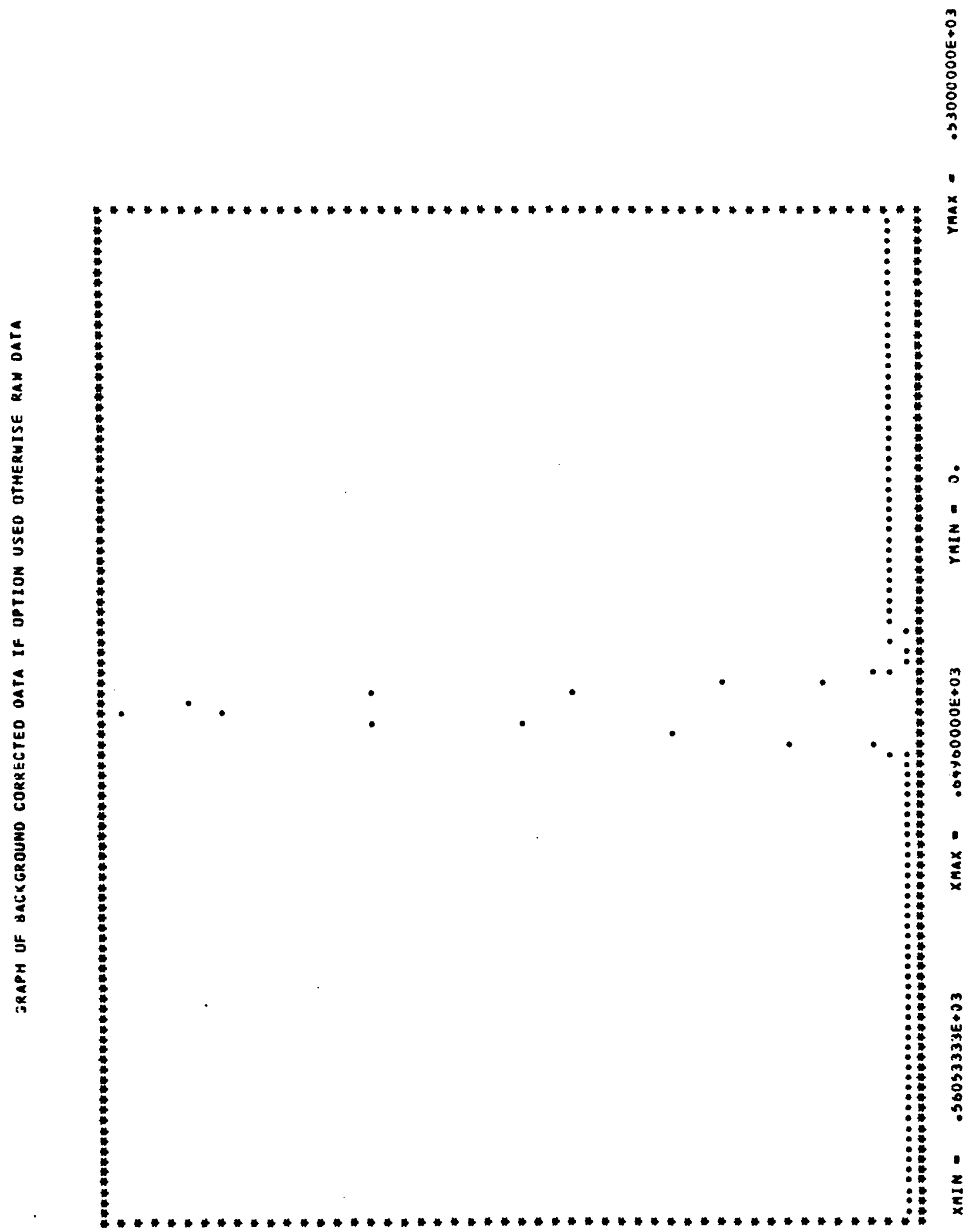
TEMPERATURE OF FIRST POINT OF DATA = 560.533 (DEG KELVIN)

PEAK BEGINS AT 602.67 DEG. K. (PEAK HEIGHT = 4.85)
PEAK ENDS AT 609.07 DEG. K. (PEAK HEIGHT = 7.03)

AREA-HEAT CONSTANT = .00095462 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .28499 DEG. K.-SEC./MILLICAL

TM= 603.02 DEG. K.


GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
XMIN = .56053333E+03
XMAX = .64960000E+03
YMIN = 0.
YMAX = .53000000E+03

81.10.7.26 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 8.500

RANGE = 10.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 20.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

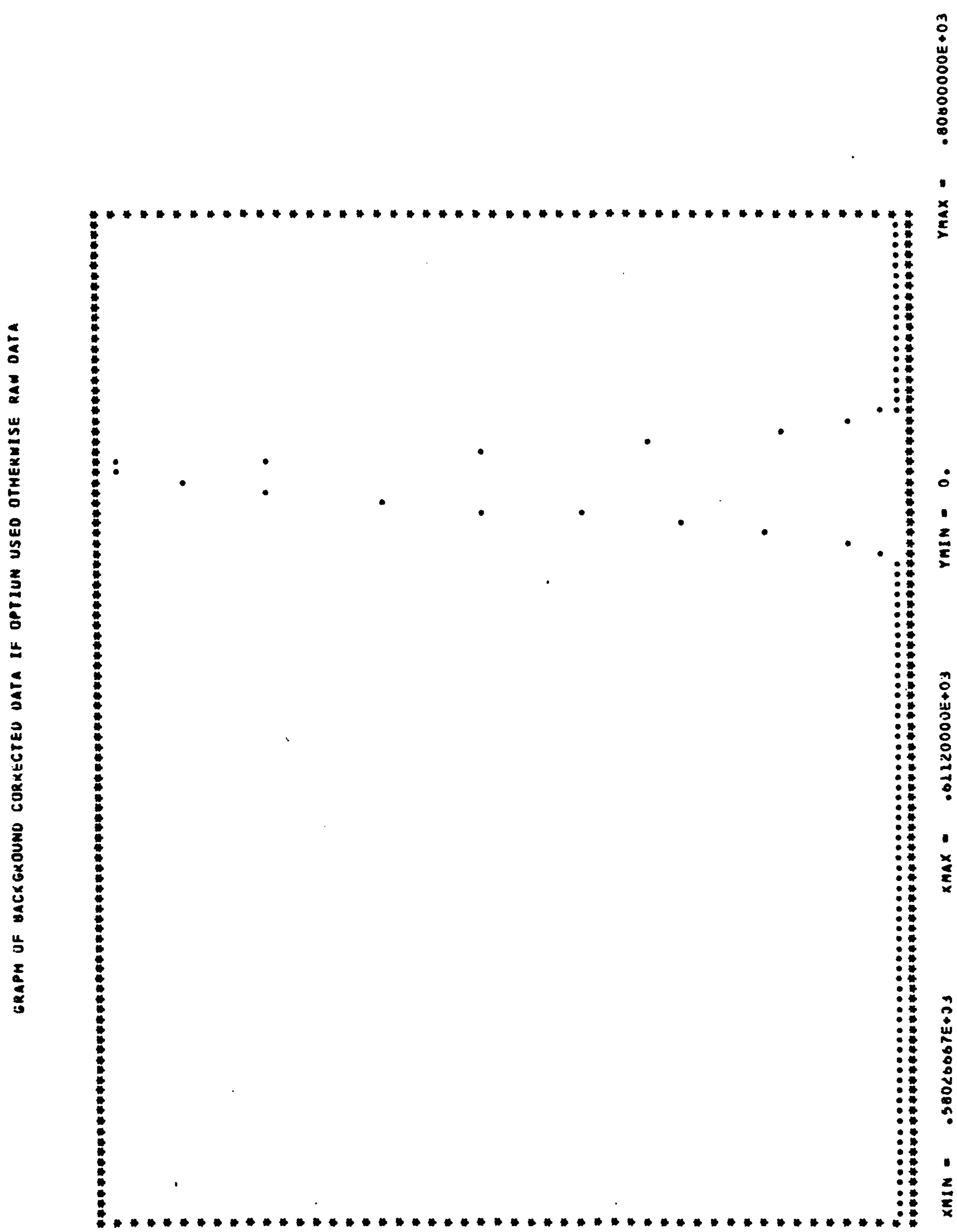
TEMPERATURE OF FIRST POINT OF DATA = 580.267 (DEG KELVIN)

PEAK BEGINS AT 601.07 DEG. K. (PEAK HEIGHT = 3.87)
PEAK ENDS AT 605.33 DEG. K. (PEAK HEIGHT = 5.78)

AREA-HEAT CONSTANT = .00094833 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .26483 DEG. K.-SEC./MILLICAL

TM= 601.45 DEG. K.


GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
XMIN = .5802667E+03
XMAX = .6112000E+03
YMIN = 0.
YMAX = .8080000E+03

81.10.7.27 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 8.500

RANGE = 10.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 10.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

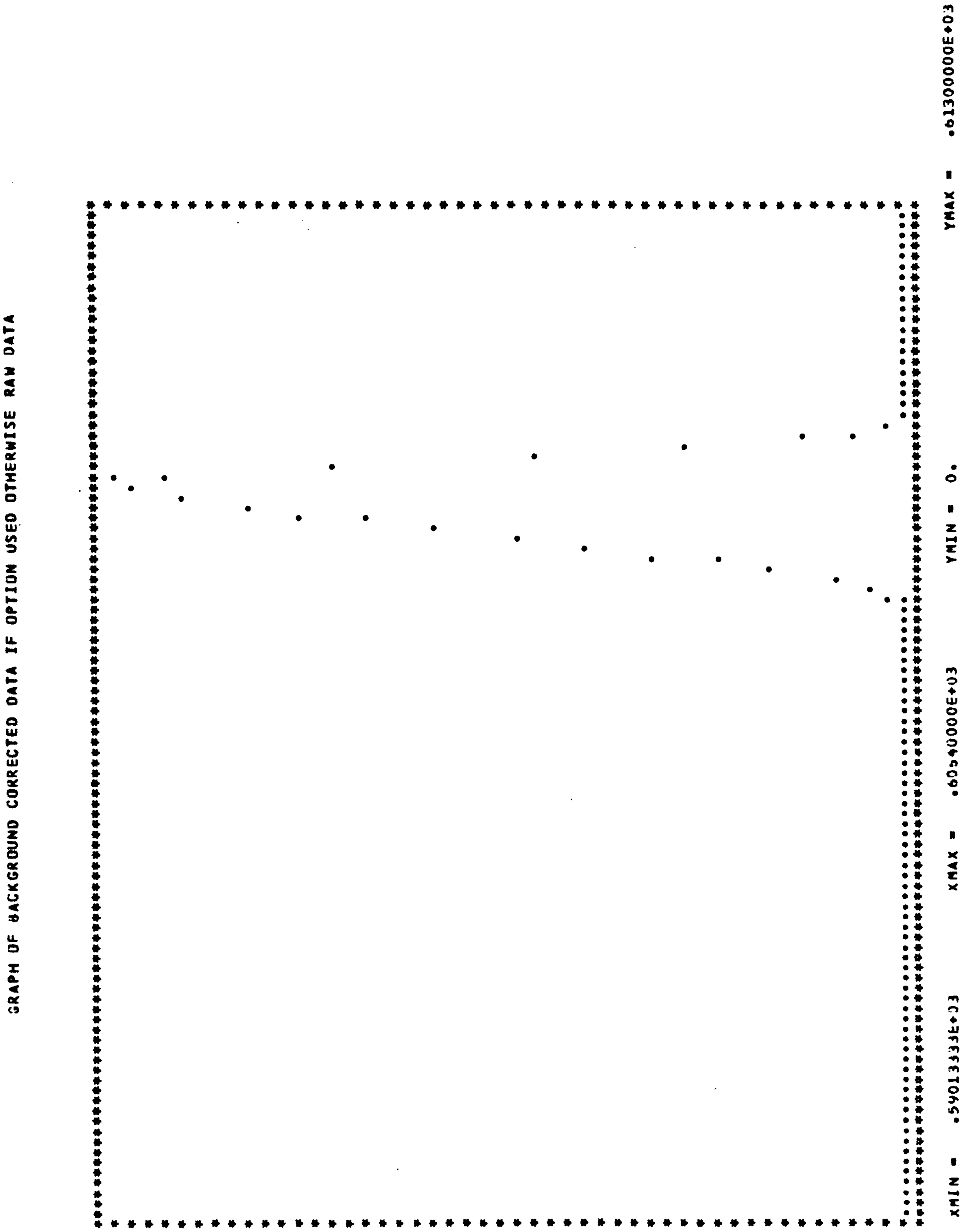
TEMPERATURE OF FIRST POINT OF DATA = 590.133 (DEG KELVIN)

PEAK BEGINS AT 600.53 DEG. K. (PEAK HEIGHT = 5.30)
PEAK ENDS AT 602.93 DEG. K. (PEAK HEIGHT = 8.08)

AREA-HEAT CONSTANT = .00097209 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .25906 DEG. K.-SEC./MILLICAL

TM= 600.61 DEG. K.


GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
XMIN = .59013333E+03
XMAX = .60540000E+03
YMIN = 0.
YMAX = .61300000E+03

81.10.7.28 LEAD

HEAT OF FUSION (CAL/GRAM) = 5.500

WEIGHT (MG) OF CALIBRATION STANDARD = 8.500

RANGE = 5.000 (MILLICAL/SEC FULL SCALE) SCAN RATE = 5.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

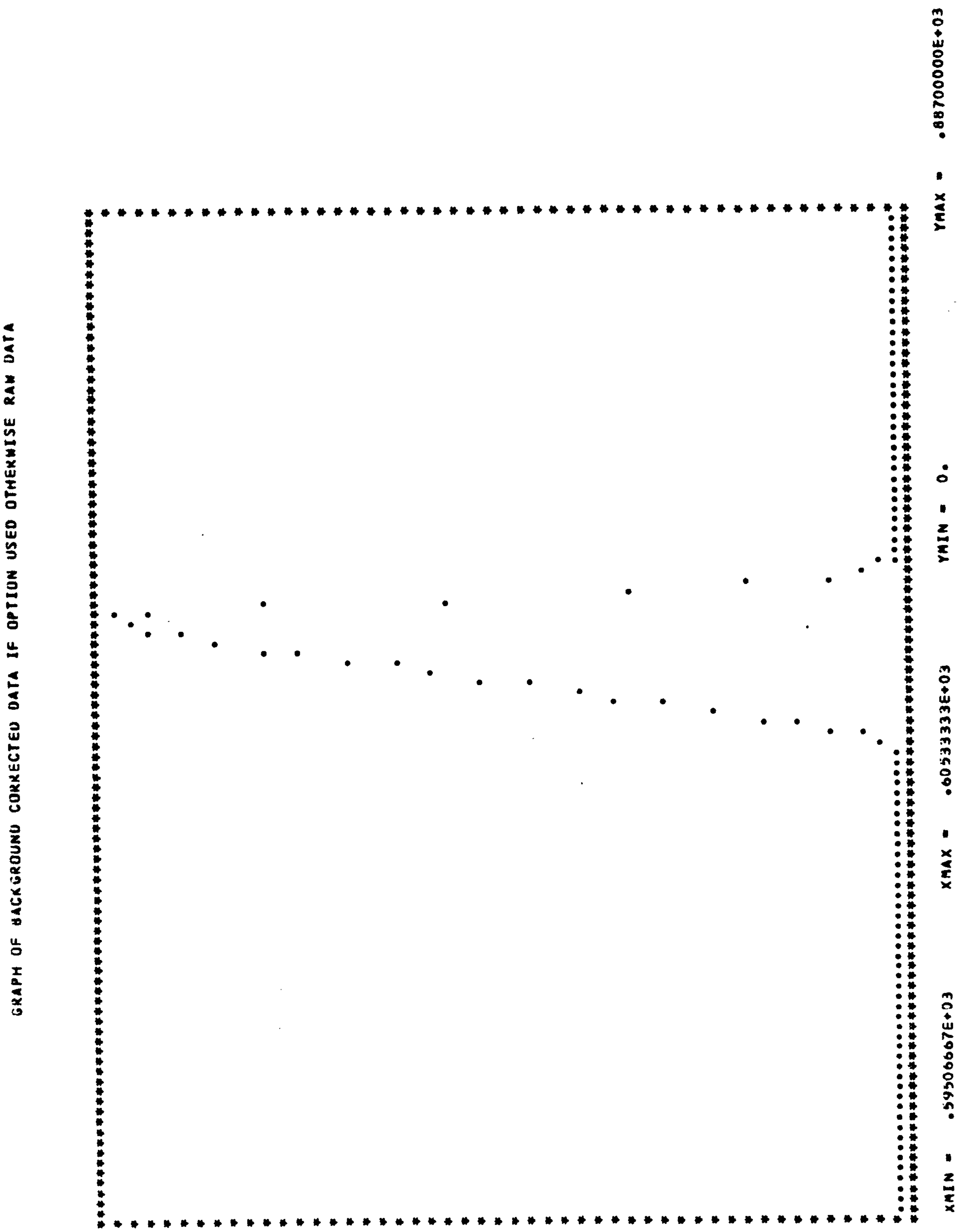
TEMPERATURE OF FIRST POINT OF DATA = 595.067 (DEG KELVIN)

PEAK BEGINS AT 600.00 DEG. K. (PEAK HEIGHT = 4.24)
PEAK ENDS AT 601.73 DEG. K. (PEAK HEIGHT = 4.49)

AREA-HEAT CONSTANT = .00095500 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .26958 DEG. K.-SEC./MILLICAL

TM= 600.13 DEG. K.


GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
XMIN = .59506667E+03
XMAX = .60533333E+03
YMIN = 0.
YMAX = .88700000E+03

APPENDIX B.1

PROGRAM KINETIC

SAMPLE DATA FILE

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20.0
60.0
323.0
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 0225 0217 0203 0187 0167 0145 0121 0097
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81.15.10.14.3 GULF ATS
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20.0
323.0
3.0
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81.11.8.21.7 GULF ATS
7.35
10.0
10.0
323.0
6.0
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 0247 0222 0200 0172 0139 0115 0087 0060
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81.11.8.21.6 GULF ATS
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5.0
323.0
9.0
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```

# APPENDIX B.2

## PROGRAM KINETIC

## SAMPLE INPUT CARDS

```
 100= KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)
 110= 0.30920 0.21155 0.18110 0.17265 0.16998
 120= 0.44179 0.29991 0.24575 0.22965 0.23405
 130=  435.24  432.49  430.94  430.12  429.70
 140=  605.75  603.22  601.67  600.84  600.38
 150=0.000905490.000917600.000920920.000924290.00093341
 160=          0.000986860.000985400.000971770.000990290.00097558
 170=
 180=1110001100           380  670  340  650  396  620  374  585  353
600
..
```

# APPENDIX B.3

# PROGRAM KINETIC

## SAMPLE OUTPUT

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

PROGRAM CONTROL CARD

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
11110011000000000000  380  670  340  650  396  620  374  585  353  600    0    0
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

CALIBRATION DATA

MELTING POINTS:
(UNITS OF KELVINS)

| HEAT RATE | TM(INDIUM) | DELTA | TM(LEAD) | DELTA |
|---|---|---|---|---|
| 80.0000 | 435.24 | 5.44 | 605.75 | 5.10 |
| 40.0000 | 432.49 | 2.69 | 603.22 | 2.57 |
| 20.0000 | 430.94 | 1.14 | 601.67 | 1.02 |
| 10.0000 | 430.12 | .32 | 600.84 | .19 |
| 5.0000 | 429.70 | -.10 | 600.38 | -.27 |
| 2.5000 | 429.80 | 0.00 | 600.65 | 0.00 |
| 1.2500 | 429.80 | 0.00 | 600.65 | 0.00 |
| .6250 | 429.80 | 0.00 | 600.65 | 0.00 |
| .3125 | 429.80 | 0.00 | 600.65 | 0.00 |

CALCULATED THERMAL CORRECTION FACTORS
STRAIGHT LINE SHOWING TRUE TEMPERATURE
VERSUS OBSERVED TEMPERATURE

| HEAT RATE | INTERCEPT | SLOPE |
|---|---|---|
| 80.0000 | -6.30768 | 1.00199 |
| 40.0000 | -2.99398 | 1.00070 |
| 20.0000 | -1.44289 | 1.00070 |
| 10.0000 | -.64753 | 1.00076 |
| 5.0000 | -.32799 | 1.00100 |
| 2.5000 | .00000 | 1.00000 |
| 1.2500 | .00000 | 1.00000 |
| .6250 | .00000 | 1.00000 |
| .3125 | .00000 | 1.00000 |

THERMAL RESISTANCE (LAG CORRECTION)
(IN UNITS OF KELVINS/(MCAL/SEC))

| HEAT RATE | TR(INDIUM) | TR(LEAD) | TR(AVERAGE) |
|---|---|---|---|
| 80.0000 | .30920 | .44179 | .37550 |
| 40.0000 | .21155 | .29991 | .25573 |
| 20.0000 | .18113 | .24575 | .21343 |
| 10.0000 | .17265 | .22965 | .20115 |
| 5.0000 | .15998 | .23405 | .20202 |
| 2.5000 | 0.00000 | 0.00000 | 0.00000 |
| 1.2500 | 0.00000 | 0.00000 | 0.00000 |
| .6250 | 0.00000 | 0.00000 | 0.00000 |
| .3125 | 0.00000 | 0.00000 | 0.00000 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

AREA HEAT CONSTANT
(UNITS OF INVERSE ENCODER UNITS
I.E.,RANGE*CON=MCAL/SEC)

| HEAT RATE | CON(INDIUM) | CON(LEAD) | CON(AVERAGE) |
|---|---|---|---|
| 80.0000 | .00090549 | .00098886 | .00094718 |
| 40.0000 | .00091760 | .00098540 | .00095150 |
| 20.0000 | .00092092 | .00097177 | .00094635 |
| 10.0000 | .00092429 | .00099029 | .00095729 |
| 5.0000 | .00093341 | .00097558 | .00095450 |
| 2.5000 | 0.00000000 | 0.00000000 | 0.00000000 |
| 1.2500 | 0.00000000 | 0.00000000 | 0.00000000 |
| .6250 | 0.00000000 | 0.00000000 | 0.00000000 |
| .3125 | 0.00000000 | 0.00000000 | 0.00000000 |

******************************************************************************************

********** 81.15.10.14.1 GULF ATS *****

******************************************************************************************

WEIGHT(MG) OF SAMPLE= 1.55
RANGE(MILLICAL/SEC FULL SCALE)=, 20.0
SCAN RATE(DEG PER MINUTE)= 80.0
TEMPERATURE(DEG KELVIN) OF FIRST POINT ON DATA TAPE= 324.07

DATA RATE (SECONDS PER DATA POINT)= .8000

| X (SECONDS) | TEMPERATURE (KELVINS) | ORIGINAL Y (E.U.) |
|---|---|---|
| .80 | 324.07 | -116. |
| 1.60 | 325.13 | -116. |
| 2.40 | 326.20 | -113. |
| 3.20 | 327.27 | -111. |
| 4.00 | 328.33 | -111. |
| 4.80 | 329.40 | -111. |
| 5.60 | 330.47 | -109. |
| 6.40 | 331.53 | -101. |
| 7.20 | 332.60 | -90. |
| 8.00 | 333.67 | -79. |
| 8.80 | 334.73 | -68. |
| 9.60 | 335.80 | -59. |
| 10.40 | 336.87 | -52. |
| 11.20 | 337.93 | -48. |
| 12.00 | 339.00 | -46. |
| 12.80 | 340.07 | -46. |
| 13.60 | 341.13 | -47. |
| 14.40 | 342.20 | -49. |
| 15.20 | 343.27 | -52. |
| 16.00 | 344.33 | -53. |

KINETIC ***81.15.10.14.1 GULF ATS

| | | |
|---|---|---|
| 16.80 | 345.40 | -56. |
| 17.60 | 346.47 | -58. |
| 18.40 | 347.53 | -60. |
| 19.20 | 348.60 | -61. |
| 20.00 | 349.67 | -62. |
| 20.80 | 350.73 | -63. |
| 21.60 | 351.80 | -65. |
| 22.40 | 352.87 | -64. |
| 23.20 | 353.93 | -64. |
| 24.00 | 355.00 | -65. |
| 24.80 | 356.07 | -65. |
| 25.60 | 357.13 | -65. |
| 26.40 | 358.20 | -65. |
| 27.20 | 359.27 | -65. |
| 28.00 | 360.33 | -65. |
| 28.80 | 361.40 | -66. |
| 29.60 | 362.47 | -67. |
| 30.40 | 363.53 | -67. |
| 31.20 | 364.60 | -68. |
| 32.00 | 365.67 | -68. |
| 32.80 | 366.73 | -69. |
| 33.60 | 367.80 | -69. |
| 34.40 | 368.87 | -70. |
| 35.20 | 369.93 | -70. |
| 36.00 | 371.00 | -70. |
| 36.80 | 372.07 | -71. |
| 37.60 | 373.13 | -72. |
| 38.40 | 374.20 | -72. |
| 39.20 | 375.27 | -72. |
| 40.00 | 376.33 | -73. |
| 40.80 | 377.40 | -75. |
| 41.60 | 378.47 | -77. |
| 42.40 | 379.53 | -76. |
| 43.20 | 380.60 | -78. |
| 44.00 | 381.67 | -78. |
| 44.80 | 382.73 | -78. |
| 45.60 | 383.80 | -77. |
| 46.40 | 384.87 | -77. |
| 47.20 | 385.93 | -77. |
| 48.00 | 387.00 | -76. |
| 48.80 | 388.07 | -77. |
| 49.60 | 389.13 | -77. |
| 50.40 | 390.20 | -77. |
| 51.20 | 391.27 | -77. |
| 52.00 | 392.33 | -77. |
| 52.80 | 393.40 | -77. |
| 53.60 | 394.47 | -77. |
| 54.40 | 395.53 | -76. |
| 55.20 | 396.60 | -76. |
| 56.00 | 397.67 | -77. |
| 56.80 | 398.73 | -77. |
| 57.60 | 399.80 | -76. |
| 58.40 | 400.87 | -77. |
| 59.20 | 401.93 | -77. |
| 60.00 | 403.00 | -77. |
| 60.80 | 404.07 | -77. |
| 61.60 | 405.13 | -76. |

KINETIC ***61.15.10.14.1 GULF ATS

| | | |
|---|---|---|
| 62.40 | 406.20 | -77. |
| 63.20 | 407.27 | -77. |
| 64.00 | 408.33 | -77. |
| 64.80 | 409.40 | -77. |
| 65.60 | 410.47 | -77. |
| 66.40 | 411.53 | -76. |
| 67.20 | 412.60 | -76. |
| 68.00 | 413.67 | -76. |
| 68.80 | 414.73 | -77. |
| 69.60 | 415.80 | -76. |
| 70.40 | 416.87 | -76. |
| 71.20 | 417.93 | -77. |
| 72.00 | 419.00 | -78. |
| 72.80 | 420.07 | -77. |
| 73.60 | 421.13 | -77. |
| 74.40 | 422.20 | -77. |
| 75.20 | 423.27 | -76. |
| 76.00 | 424.33 | -75. |
| 76.80 | 425.40 | -75. |
| 77.60 | 426.47 | -75. |
| 78.40 | 427.53 | -75. |
| 79.20 | 428.60 | -75. |
| 80.00 | 429.67 | -75. |
| 80.80 | 430.73 | -75. |
| 81.60 | 431.80 | -74. |
| 82.40 | 432.87 | -73. |
| 83.20 | 433.93 | -73. |
| 84.00 | 435.00 | -73. |
| 84.80 | 436.07 | -73. |
| 85.60 | 437.13 | -74. |
| 86.40 | 438.20 | -74. |
| 87.20 | 439.27 | -74. |
| 88.00 | 440.33 | -74. |
| 88.80 | 441.40 | -74. |
| 89.60 | 442.47 | -74. |
| 90.40 | 443.53 | -74. |
| 91.20 | 444.60 | -73. |
| 92.00 | 445.67 | -74. |
| 92.80 | 446.73 | -73. |
| 93.60 | 447.80 | -74. |
| 94.40 | 448.87 | -74. |
| 95.20 | 449.93 | -74. |
| 96.00 | 451.00 | -74. |
| 96.80 | 452.07 | -74. |
| 97.60 | 453.13 | -73. |
| 98.40 | 454.20 | -73. |
| 99.20 | 455.27 | -73. |
| 100.00 | 456.33 | -73. |
| 100.80 | 457.40 | -73. |
| 101.60 | 458.47 | -73. |
| 102.40 | 459.53 | -73. |
| 103.20 | 460.60 | -73. |
| 104.00 | 461.67 | -72. |
| 104.80 | 462.73 | -72. |
| 105.60 | 463.80 | -72. |
| 106.40 | 464.87 | -72. |
| 107.20 | 465.93 | -72. |

KINETIC ***81.15.10.14.1 GULF ATS

| | | |
|---|---|---|
| 108.00 | 467.00 | -71. |
| 108.80 | 468.07 | -71. |
| 109.60 | 469.13 | -71. |
| 110.40 | 470.20 | -71. |
| 111.20 | 471.27 | -70. |
| 112.00 | 472.33 | -69. |
| 112.80 | 473.40 | -69. |
| 113.60 | 474.47 | -69. |
| 114.40 | 475.53 | -68. |
| 115.20 | 476.60 | -68. |
| 116.00 | 477.67 | -68. |
| 116.80 | 478.73 | -67. |
| 117.60 | 479.80 | -66. |
| 118.40 | 480.87 | -65. |
| 119.20 | 481.93 | -64. |
| 120.00 | 483.00 | -64. |
| 120.80 | 484.07 | -63. |
| 121.60 | 485.13 | -62. |
| 122.40 | 486.20 | -61. |
| 123.20 | 487.27 | -60. |
| 124.00 | 488.33 | -59. |
| 124.80 | 489.40 | -58. |
| 125.60 | 490.47 | -56. |
| 126.40 | 491.53 | -54. |
| 127.20 | 492.60 | -53. |
| 128.00 | 493.67 | -52. |
| 128.80 | 494.73 | -50. |
| 129.60 | 495.80 | -49. |
| 130.40 | 496.87 | -47. |
| 131.20 | 497.93 | -45. |
| 132.00 | 499.00 | -43. |
| 132.80 | 500.07 | -41. |
| 133.60 | 501.13 | -39. |
| 134.40 | 502.20 | -36. |
| 135.20 | 503.27 | -34. |
| 136.00 | 504.33 | -32. |
| 136.80 | 505.40 | -29. |
| 137.60 | 506.47 | -26. |
| 138.40 | 507.53 | -23. |
| 139.20 | 508.60 | -20. |
| 140.00 | 509.67 | -17. |
| 140.80 | 510.73 | -14. |
| 141.60 | 511.80 | -10. |
| 142.40 | 512.87 | -8. |
| 143.20 | 513.93 | -3. |
| 144.00 | 515.00 | 1. |
| 144.80 | 516.07 | 5. |
| 145.60 | 517.13 | 9. |
| 146.40 | 518.20 | 13. |
| 147.20 | 519.27 | 18. |
| 148.00 | 520.33 | 24. |
| 148.80 | 521.40 | 29. |
| 149.60 | 522.47 | 35. |
| 150.40 | 523.53 | 40. |
| 151.20 | 524.60 | 46. |
| 152.00 | 525.67 | 53. |
| 152.80 | 526.73 | 59. |

KINETIC ***81.15.10.14.1 GULF ATS

| | | |
|---|---|---|
| 153.60 | 527.80 | 65. |
| 154.40 | 528.87 | 72. |
| 155.20 | 529.93 | 79. |
| 156.00 | 531.00 | 86. |
| 156.80 | 532.07 | 93. |
| 157.60 | 533.13 | 100. |
| 158.40 | 534.20 | 108. |
| 159.20 | 535.27 | 116. |
| 160.00 | 536.33 | 124. |
| 160.80 | 537.40 | 132. |
| 161.60 | 538.47 | 141. |
| 162.40 | 539.53 | 149. |
| 163.20 | 540.60 | 158. |
| 164.00 | 541.67 | 166. |
| 164.80 | 542.73 | 175. |
| 165.60 | 543.80 | 183. |
| 166.40 | 544.87 | 190. |
| 167.20 | 545.93 | 197. |
| 168.00 | 547.00 | 204. |
| 168.80 | 548.07 | 209. |
| 169.60 | 549.13 | 213. |
| 170.40 | 550.20 | 216. |
| 171.20 | 551.27 | 217. |
| 172.00 | 552.33 | 215. |
| 172.80 | 553.40 | 212. |
| 173.60 | 554.47 | 206. |
| 174.40 | 555.53 | 197. |
| 175.20 | 556.60 | 186. |
| 176.00 | 557.67 | 174. |
| 176.80 | 558.73 | 159. |
| 177.60 | 559.80 | 144. |
| 178.40 | 560.87 | 129. |
| 179.20 | 561.93 | 113. |
| 180.00 | 563.00 | 98. |
| 180.80 | 564.07 | 83. |
| 181.60 | 565.13 | 69. |
| 182.40 | 566.20 | 56. |
| 183.20 | 567.27 | 44. |
| 184.00 | 568.33 | 32. |
| 184.80 | 569.40 | 23. |
| 185.60 | 570.47 | 13. |
| 186.40 | 571.53 | 5. |
| 187.20 | 572.60 | -2. |
| 188.00 | 573.67 | -9. |
| 188.80 | 574.73 | -15. |
| 189.60 | 575.80 | -20. |
| 190.40 | 576.87 | -25. |
| 191.20 | 577.93 | -30. |
| 192.00 | 579.00 | -33. |
| 192.80 | 580.07 | -37. |
| 193.60 | 581.13 | -40. |
| 194.40 | 582.20 | -44. |
| 195.20 | 583.27 | -46. |
| 196.00 | 584.33 | -49. |
| 196.80 | 585.40 | -51. |
| 197.60 | 586.47 | -54. |
| 198.40 | 587.53 | -55. |

KINETIC ***81.15.10.14.1 GULF ATS

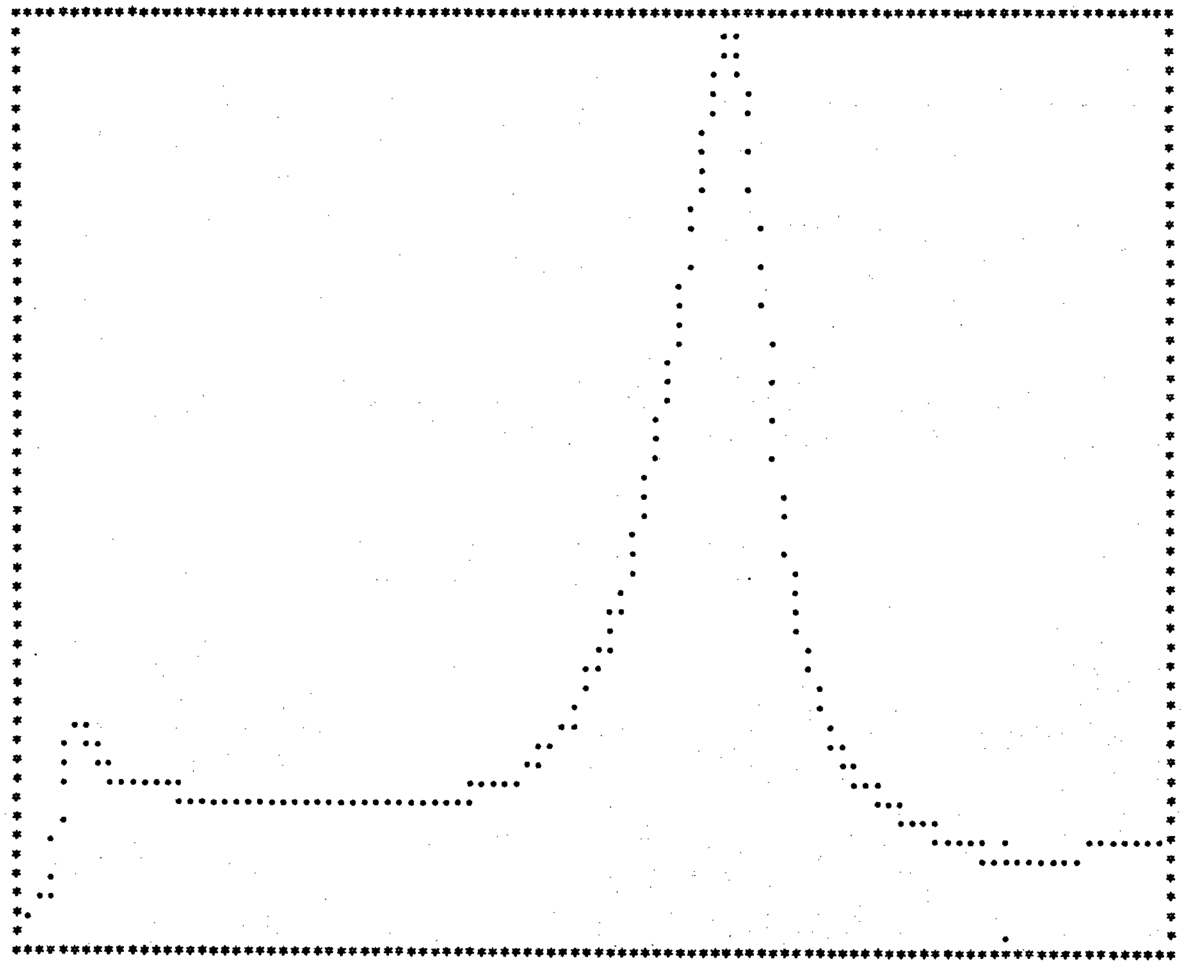
| | | |
|---|---|---|
| 199.20 | 588.60 | -58. |
| 200.00 | 589.67 | -59. |
| 200.80 | 590.73 | -61. |
| 201.60 | 591.80 | -62. |
| 202.40 | 592.87 | -64. |
| 203.20 | 593.93 | -66. |
| 204.00 | 595.00 | -67. |
| 204.80 | 596.07 | -69. |
| 205.60 | 597.13 | -69. |
| 206.40 | 598.20 | -71. |
| 207.20 | 599.27 | -71. |
| 208.00 | 600.33 | -72. |
| 208.80 | 601.40 | -73. |
| 209.60 | 602.47 | -74. |
| 210.40 | 603.53 | -75. |
| 211.20 | 604.60 | -75. |
| 212.00 | 605.67 | -77. |
| 212.80 | 606.73 | -77. |
| 213.60 | 607.80 | -79. |
| 214.40 | 608.87 | -79. |
| 215.20 | 609.93 | -80. |
| 216.00 | 611.00 | -80. |
| 216.80 | 612.07 | -81. |
| 217.60 | 613.13 | -82. |
| 218.40 | 614.20 | -83. |
| 219.20 | 615.27 | -83. |
| 220.00 | 616.33 | -84. |
| 220.80 | 617.40 | -85. |
| 221.60 | 618.47 | -86. |
| 222.40 | 619.53 | -87. |
| 223.20 | 620.60 | -88. |
| 224.00 | 621.67 | -89. |
| 224.80 | 622.73 | -89. |
| 225.60 | 623.80 | -89. |
| 226.40 | 624.87 | -90. |
| 227.20 | 625.93 | -91. |
| 228.00 | 627.00 | -91. |
| 228.80 | 628.07 | -92. |
| 229.60 | 629.13 | -93. |
| 230.40 | 630.20 | -93. |
| 231.20 | 631.27 | -93. |
| 232.00 | 632.33 | -94. |
| 232.80 | 633.40 | -94. |
| 233.60 | 634.47 | -95. |
| 234.40 | 635.53 | -96. |
| 235.20 | 636.60 | -96. |
| 236.00 | 637.67 | -95. |
| 236.80 | 638.73 | -96. |
| 237.60 | 639.80 | -126. |
| 238.40 | 640.87 | -93. |
| 239.20 | 641.93 | -96. |
| 240.00 | 643.00 | -97. |
| 240.80 | 644.07 | -97. |
| 241.60 | 645.13 | -97. |
| 242.40 | 646.20 | -96. |
| 243.20 | 647.27 | -96. |
| 244.00 | 648.33 | -96. |

KINETIC ***81.15.10.14.1 GULF ATS

| | | |
|---|---|---|
| 244.80 | 649.40 | -96. |
| 245.60 | 650.47 | -96. |
| 246.40 | 651.53 | -96. |
| 247.20 | 652.60 | -96. |
| 248.00 | 653.67 | -96. |
| 248.80 | 654.73 | -95. |
| 249.60 | 655.80 | -95. |
| 250.40 | 656.87 | -95. |
| 251.20 | 657.93 | -95. |
| 252.00 | 659.00 | -95. |
| 252.80 | 660.07 | -95. |
| 253.60 | 661.13 | -94. |
| 254.40 | 662.20 | -94. |
| 255.20 | 663.27 | -94. |
| 256.00 | 664.33 | -94. |
| 256.80 | 665.40 | -93. |
| 257.60 | 666.47 | -93. |
| 258.40 | 667.53 | -93. |
| 259.20 | 668.60 | -93. |
| 260.00 | 669.67 | -92. |
| 260.80 | 670.73 | -92. |
| 261.60 | 671.80 | -92. |
| 262.40 | 672.87 | -91. |
| 263.20 | 673.93 | -92. |
| 264.00 | 675.00 | -92. |
| 264.80 | 676.07 | -92. |
| 265.60 | 677.13 | -91. |
| 266.40 | 678.20 | -92. |
| 267.20 | 679.27 | -92. |
| 268.00 | 680.33 | -92. |
| 268.80 | 681.40 | -92. |
| 269.60 | 682.47 | -92. |
| 270.40 | 683.53 | -93. |
| 271.20 | 684.60 | -93. |
| 272.00 | 685.67 | -93. |
| 272.80 | 686.73 | -93. |
| 273.60 | 687.80 | -93. |
| 274.40 | 688.87 | -93. |
| 275.20 | 689.93 | -93. |

KINETIC ***81.15.10.14.1 GULF ATS

GRAPH OF RAW DATA



XMIN = .32406667E+03 XMAX = .68886667E+03 YMIN = -.12600000E+03 YMAX = .21700000E+03

KINETIC ***81.15.10.14.1 GULF ATS

MAXIMUM ORDINATE= 217.0 OCCURS AT 551.27 DEG KELVIN.

PEAK SEARCH LIMITS: START PT.= 379.5 STOP PT.= 669.7 DEG. KELVIN

THE PEAK ENDS AT 255 POINTS FROM START. THE Y AT THIS POINT IS -75.77
THE BASELINE EQUATION IS Y= -.37304E+00*X+ .19350E+02

THE PEAK STARTS AT 155 POINTS FROM THE START. THE Y AT THIS POINT IS -67.17
THE BASELINE EQUATION IS Y= .12345E+00*X+ -.86304E+02

PEAK BEGINS AT 488.33 DEG KELVIN (PEAK HEIGHT = -67.17) (DATA PT. 155)
PEAK ENDS AT 595.00 DEG KELVIN (PEAK HEIGHT = -75.77) (DATA PT. 255)

NUMBER OF POINTS IN PEAK= 100

BASELINE SHIFT COMPENSATED IS -3.88

TEMPERATURES HAVE NOW BEEN CORRECTED FOR THERMAL LAG, SCAN RATE EFFECT,AND CALIBRATION ERROR.
MAGNITUDE OF THE CORRECTION AT MAXIMUM ORDINATE IS: -3.15

**************************************************************************************************

********** 81.15.10.14.2 GULF ATS *****

**************************************************************************************************

WEIGHT(MG) OF SAMPLE= 4.07
RANGE(MILLICAL/SEC FULL SCALE)=, 20.0
SCAN RATE(DEG PER MINUTE(= 40.0
TEMPERATURE(DEG KELVIN) OF FIRST POINT ON DATA TAPE= 324.00

DATA RATE (SECONDS PER DATA POINT)= 1.5000

| X (SECONDS) | TEMPERATURE (KELVINS) | ORIGINAL Y (E.U.) |
|---|---|---|
| 1.50 | 324.00 | -160. |
| 3.00 | 325.00 | -160. |
| 4.50 | 326.00 | -159. |
| 6.00 | 327.00 | -164. |
| 7.50 | 328.00 | -167. |
| 9.00 | 329.00 | -166. |
| 10.50 | 330.00 | -164. |
| 12.00 | 331.00 | -163. |
| 13.50 | 332.00 | -162. |
| 15.00 | 333.00 | -162. |
| 16.50 | 334.00 | -162. |
| 18.00 | 335.00 | -163. |

KINETIC ***81.15.10.14.2 GULF ATS

| | | |
|---|---|---|
| 19.50 | 336.00 | -163. |
| 21.00 | 337.00 | -164. |
| 22.50 | 338.00 | -164. |
| 24.00 | 339.00 | -164. |
| 25.50 | 340.00 | -165. |
| 27.00 | 341.00 | -165. |
| 28.50 | 342.00 | -166. |
| 30.00 | 343.00 | -166. |
| 31.50 | 344.00 | -166. |
| 33.00 | 345.00 | -166. |
| 34.50 | 346.00 | -167. |
| 36.00 | 347.00 | -167. |
| 37.50 | 348.00 | -168. |
| 39.00 | 349.00 | -169. |
| 40.50 | 350.00 | -169. |
| 42.00 | 351.00 | -170. |
| 43.50 | 352.00 | -170. |
| 45.00 | 353.00 | -169. |
| 46.50 | 354.00 | -168. |
| 48.00 | 355.00 | -168. |
| 49.50 | 356.00 | -168. |
| 51.00 | 357.00 | -166. |
| 52.50 | 358.00 | -168. |
| 54.00 | 359.00 | -168. |
| 55.50 | 360.00 | -167. |
| 57.00 | 361.00 | -167. |
| 58.50 | 362.00 | -168. |
| 60.00 | 363.00 | -168. |
| 61.50 | 364.00 | -168. |
| 63.00 | 365.00 | -168. |
| 64.50 | 366.00 | -168. |
| 66.00 | 367.00 | -169. |
| 67.50 | 368.00 | -169. |
| 69.00 | 369.00 | -169. |
| 70.50 | 370.00 | -169. |
| 72.00 | 371.00 | -170. |
| 73.50 | 372.00 | -170. |
| 75.00 | 373.00 | -170. |
| 76.50 | 374.00 | -170. |
| 78.00 | 375.00 | -170. |
| 79.50 | 376.00 | -171. |
| 81.00 | 377.00 | -171. |
| 82.50 | 378.00 | -171. |
| 84.00 | 379.00 | -171. |
| 85.50 | 380.00 | -172. |
| 87.00 | 381.00 | -172. |
| 88.50 | 382.00 | -172. |
| 90.00 | 383.00 | -172. |
| 91.50 | 384.00 | -172. |
| 93.00 | 385.00 | -171. |
| 94.50 | 386.00 | -172. |
| 96.00 | 387.00 | -173. |
| 97.50 | 388.00 | -172. |
| 99.00 | 389.00 | -171. |
| 100.50 | 390.00 | -172. |
| 102.00 | 391.00 | -172. |
| 103.50 | 392.00 | -173. |

KINETIC ***81.15.10.14.2 GULF ATS

| | | |
|---|---|---|
| 105.00 | 393.00 | -172. |
| 106.50 | 394.00 | -172. |
| 108.00 | 395.00 | -172. |
| 109.50 | 396.00 | -172. |
| 111.00 | 397.00 | -172. |
| 112.50 | 398.00 | -172. |
| 114.00 | 399.00 | -171. |
| 115.50 | 400.00 | -172. |
| 117.00 | 401.00 | -171. |
| 118.50 | 402.00 | -171. |
| 120.00 | 403.00 | -171. |
| 121.50 | 404.00 | -172. |
| 123.00 | 405.00 | -171. |
| 124.50 | 406.00 | -172. |
| 126.00 | 407.00 | -171. |
| 127.50 | 408.00 | -171. |
| 129.00 | 409.00 | -172. |
| 130.50 | 410.00 | -172. |
| 132.00 | 411.00 | -171. |
| 133.50 | 412.00 | -171. |
| 135.00 | 413.00 | -170. |
| 136.50 | 414.00 | -170. |
| 138.00 | 415.00 | -171. |
| 139.50 | 416.00 | -170. |
| 141.00 | 417.00 | -171. |
| 142.50 | 418.00 | -170. |
| 144.00 | 419.00 | -170. |
| 145.50 | 420.00 | -170. |
| 147.00 | 421.00 | -170. |
| 148.50 | 422.00 | -170. |
| 150.00 | 423.00 | -169. |
| 151.50 | 424.00 | -170. |
| 153.00 | 425.00 | -169. |
| 154.50 | 426.00 | -169. |
| 156.00 | 427.00 | -169. |
| 157.50 | 428.00 | -169. |
| 159.00 | 429.00 | -169. |
| 160.50 | 430.00 | -169. |
| 162.00 | 431.00 | -169. |
| 163.50 | 432.00 | -168. |
| 165.00 | 433.00 | -168. |
| 166.50 | 434.00 | -166. |
| 168.00 | 435.00 | -166. |
| 169.50 | 436.00 | -166. |
| 171.00 | 437.00 | -165. |
| 172.50 | 438.00 | -165. |
| 174.00 | 439.00 | -165. |
| 175.50 | 440.00 | -165. |
| 177.00 | 441.00 | -165. |
| 178.50 | 442.00 | -164. |
| 180.00 | 443.00 | -164. |
| 181.50 | 444.00 | -163. |
| 183.00 | 445.00 | -164. |
| 184.50 | 446.00 | -163. |
| 186.00 | 447.00 | -163. |
| 187.50 | 448.00 | -162. |
| 189.00 | 449.00 | -162. |

KINETIC ***81.15.10.14.2 GULF ATS

| | | |
|---|---|---|
| 190.50 | 450.00 | -161. |
| 192.00 | 451.00 | -161. |
| 193.50 | 452.00 | -161. |
| 195.00 | 453.00 | -160. |
| 196.50 | 454.00 | -159. |
| 198.00 | 455.00 | -158. |
| 199.50 | 456.00 | -159. |
| 201.00 | 457.00 | -158. |
| 202.50 | 458.00 | -157. |
| 204.00 | 459.00 | -157. |
| 205.50 | 460.00 | -156. |
| 207.00 | 461.00 | -155. |
| 208.50 | 462.00 | -154. |
| 210.00 | 463.00 | -153. |
| 211.50 | 464.00 | -152. |
| 213.00 | 465.00 | -151. |
| 214.50 | 466.00 | -150. |
| 216.00 | 467.00 | -149. |
| 217.50 | 468.00 | -148. |
| 219.00 | 469.00 | -146. |
| 220.50 | 470.00 | -144. |
| 222.00 | 471.00 | -143. |
| 223.50 | 472.00 | -142. |
| 225.00 | 473.00 | -140. |
| 226.50 | 474.00 | -138. |
| 228.00 | 475.00 | -136. |
| 229.50 | 476.00 | -134. |
| 231.00 | 477.00 | -133. |
| 232.50 | 478.00 | -130. |
| 234.00 | 479.00 | -128. |
| 235.50 | 480.00 | -126. |
| 237.00 | 481.00 | -123. |
| 238.50 | 482.00 | -121. |
| 240.00 | 483.00 | -118. |
| 241.50 | 484.00 | -115. |
| 243.00 | 485.00 | -112. |
| 244.50 | 486.00 | -108. |
| 246.00 | 487.00 | -105. |
| 247.50 | 488.00 | -101. |
| 249.00 | 489.00 | -98. |
| 250.50 | 490.00 | -94. |
| 252.00 | 491.00 | -90. |
| 253.50 | 492.00 | -86. |
| 255.00 | 493.00 | -81. |
| 256.50 | 494.00 | -77. |
| 258.00 | 495.00 | -72. |
| 259.50 | 496.00 | -66. |
| 261.00 | 497.00 | -61. |
| 262.50 | 498.00 | -55. |
| 264.00 | 499.00 | -49. |
| 265.50 | 500.00 | -44. |
| 267.00 | 501.00 | -37. |
| 268.50 | 502.00 | -30. |
| 270.00 | 503.00 | -23. |
| 271.50 | 504.00 | -16. |
| 273.00 | 505.00 | -8. |
| 274.50 | 506.00 | 0. |

KINETIC ***81.15.10.14.2 GULF ATS

| | | |
|---|---|---|
| 276.00 | 507.00 | 8. |
| 277.50 | 508.00 | 16. |
| 279.00 | 509.00 | 25. |
| 280.50 | 510.00 | 34. |
| 282.00 | 511.00 | 44. |
| 283.50 | 512.00 | 53. |
| 285.00 | 513.00 | 63. |
| 286.50 | 514.00 | 74. |
| 288.00 | 515.00 | 84. |
| 289.50 | 516.00 | 95. |
| 291.00 | 517.00 | 106. |
| 292.50 | 518.00 | 118. |
| 294.00 | 519.00 | 129. |
| 295.50 | 520.00 | 142. |
| 297.00 | 521.00 | 153. |
| 298.50 | 522.00 | 163. |
| 300.00 | 523.00 | 177. |
| 301.50 | 524.00 | 188. |
| 303.00 | 525.00 | 199. |
| 304.50 | 526.00 | 209. |
| 306.00 | 527.00 | 217. |
| 307.50 | 528.00 | 224. |
| 309.00 | 529.00 | 229. |
| 310.50 | 530.00 | 231. |
| 312.00 | 531.00 | 230. |
| 313.50 | 532.00 | 225. |
| 315.00 | 533.00 | 217. |
| 316.50 | 534.00 | 203. |
| 318.00 | 535.00 | 187. |
| 319.50 | 536.00 | 167. |
| 321.00 | 537.00 | 145. |
| 322.50 | 538.00 | 121. |
| 324.00 | 539.00 | 97. |
| 325.50 | 540.00 | 74. |
| 327.00 | 541.00 | 52. |
| 328.50 | 542.00 | 30. |
| 330.00 | 543.00 | 12. |
| 331.50 | 544.00 | -5. |
| 333.00 | 545.00 | -21. |
| 334.50 | 546.00 | -34. |
| 336.00 | 547.00 | -47. |
| 337.50 | 548.00 | -58. |
| 339.00 | 549.00 | -68. |
| 340.50 | 550.00 | -76. |
| 342.00 | 551.00 | -84. |
| 343.50 | 552.00 | -91. |
| 345.00 | 553.00 | -97. |
| 346.50 | 554.00 | -102. |
| 348.00 | 555.00 | -107. |
| 349.50 | 556.00 | -112. |
| 351.00 | 557.00 | -115. |
| 352.50 | 558.00 | -119. |
| 354.00 | 559.00 | -123. |
| 355.50 | 560.00 | -125. |
| 357.00 | 561.00 | -129. |
| 358.50 | 562.00 | -131. |
| 360.00 | 563.00 | -134. |

KINETIC ***81.15.10.14.2 GULF ATS

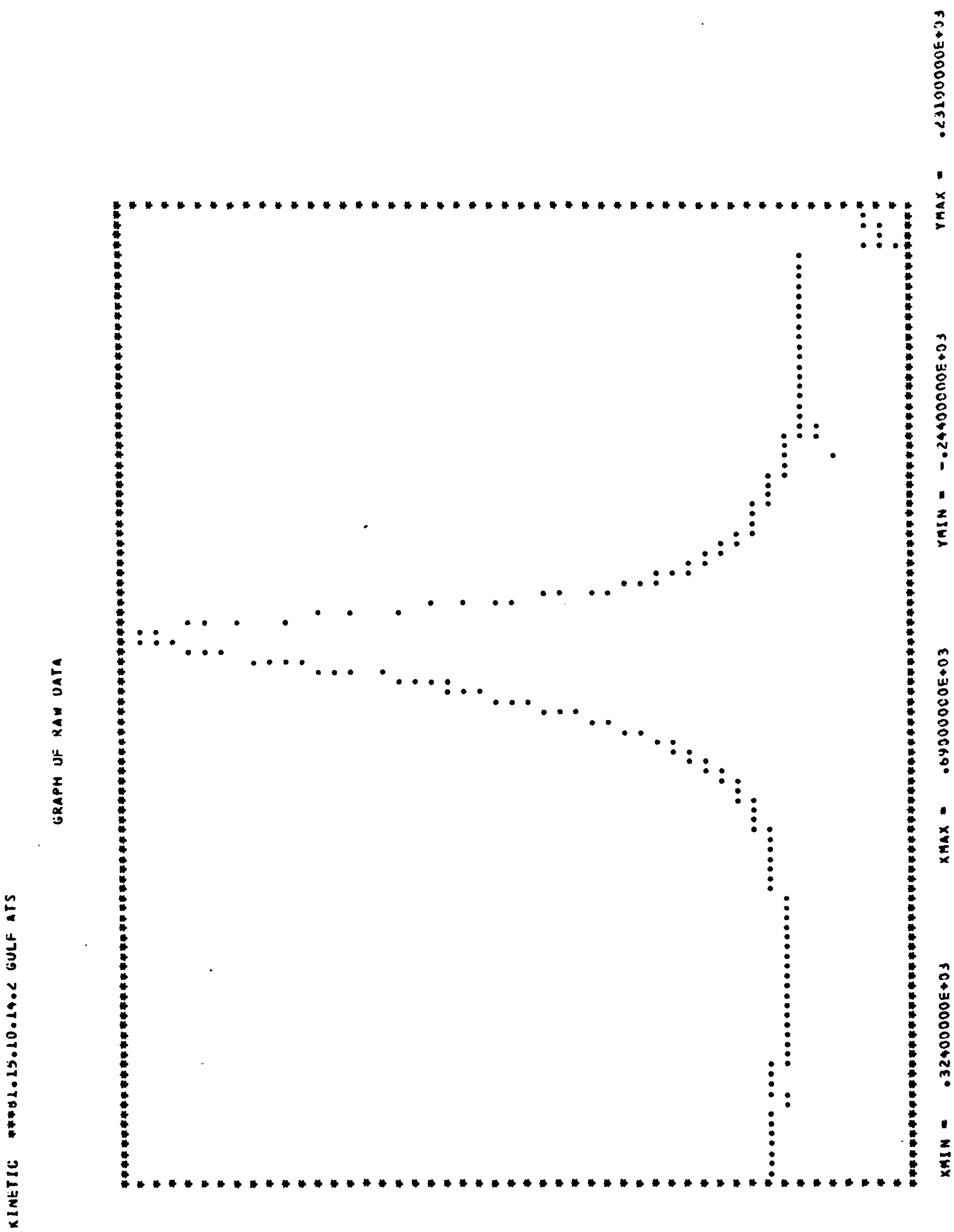
| | | |
|---|---|---|
| 361.50 | 564.00 | -137. |
| 363.00 | 565.00 | -138. |
| 364.50 | 566.00 | -140. |
| 366.00 | 567.00 | -142. |
| 367.50 | 568.00 | -144. |
| 369.00 | 569.00 | -146. |
| 370.50 | 570.00 | -147. |
| 372.00 | 571.00 | -149. |
| 373.50 | 572.00 | -150. |
| 375.00 | 573.00 | -151. |
| 376.50 | 574.00 | -153. |
| 378.00 | 575.00 | -153. |
| 379.50 | 576.00 | -154. |
| 381.00 | 577.00 | -155. |
| 382.50 | 578.00 | -157. |
| 384.00 | 579.00 | -157. |
| 385.50 | 580.00 | -159. |
| 387.00 | 581.00 | -160. |
| 388.50 | 582.00 | -160. |
| 390.00 | 583.00 | -161. |
| 391.50 | 584.00 | -162. |
| 393.00 | 585.00 | -162. |
| 394.50 | 586.00 | -163. |
| 396.00 | 587.00 | -164. |
| 397.50 | 588.00 | -165. |
| 399.00 | 589.00 | -166. |
| 400.50 | 590.00 | -167. |
| 402.00 | 591.00 | -167. |
| 403.50 | 592.00 | -168. |
| 405.00 | 593.00 | -169. |
| 406.50 | 594.00 | -169. |
| 408.00 | 595.00 | -169. |
| 409.50 | 596.00 | -170. |
| 411.00 | 597.00 | -171. |
| 412.50 | 598.00 | -171. |
| 414.00 | 599.00 | -172. |
| 415.50 | 600.00 | -173. |
| 417.00 | 601.00 | -200. |
| 418.50 | 602.00 | -176. |
| 420.00 | 603.00 | -175. |
| 421.50 | 604.00 | -176. |
| 423.00 | 605.00 | -177. |
| 424.50 | 606.00 | -177. |
| 426.00 | 607.00 | -189. |
| 427.50 | 608.00 | -188. |
| 429.00 | 609.00 | -180. |
| 430.50 | 610.00 | -190. |
| 432.00 | 611.00 | -187. |
| 433.50 | 612.00 | -191. |
| 435.00 | 613.00 | -181. |
| 436.50 | 614.00 | -181. |
| 438.00 | 615.00 | -182. |
| 439.50 | 616.00 | -182. |
| 441.00 | 617.00 | -183. |
| 442.50 | 618.00 | -183. |
| 444.00 | 619.00 | -183. |
| 445.50 | 620.00 | -184. |

KINETIC ***81.15.10.14.2 GULF ATS

| | | |
|---|---|---|
| 447.00 | 621.00 | -184. |
| 448.50 | 622.00 | -184. |
| 450.00 | 623.00 | -184. |
| 451.50 | 624.00 | -184. |
| 453.00 | 625.00 | -185. |
| 454.50 | 626.00 | -185. |
| 456.00 | 627.00 | -186. |
| 457.50 | 628.00 | -185. |
| 459.00 | 629.00 | -185. |
| 460.50 | 630.00 | -185. |
| 462.00 | 631.00 | -185. |
| 463.50 | 632.00 | -185. |
| 465.00 | 633.00 | -185. |
| 466.50 | 634.00 | -184. |
| 468.00 | 635.00 | -184. |
| 469.50 | 636.00 | -185. |
| 471.00 | 637.00 | -184. |
| 472.50 | 638.00 | -184. |
| 474.00 | 639.00 | -183. |
| 475.50 | 640.00 | -183. |
| 477.00 | 641.00 | -183. |
| 478.50 | 642.00 | -183. |
| 480.00 | 643.00 | -183. |
| 481.50 | 644.00 | -182. |
| 483.00 | 645.00 | -182. |
| 484.50 | 646.00 | -182. |
| 486.00 | 647.00 | -182. |
| 487.50 | 648.00 | -181. |
| 489.00 | 649.00 | -182. |
| 490.50 | 650.00 | -181. |
| 492.00 | 651.00 | -181. |
| 493.50 | 652.00 | -181. |
| 495.00 | 653.00 | -181. |
| 496.50 | 654.00 | -180. |
| 498.00 | 655.00 | -180. |
| 499.50 | 656.00 | -180. |
| 501.00 | 657.00 | -180. |
| 502.50 | 658.00 | -180. |
| 504.00 | 659.00 | -180. |
| 505.50 | 660.00 | -180. |
| 507.00 | 661.00 | -180. |
| 508.50 | 662.00 | -180. |
| 510.00 | 663.00 | -180. |
| 511.50 | 664.00 | -180. |
| 513.00 | 665.00 | -180. |
| 514.50 | 666.00 | -180. |
| 516.00 | 667.00 | -180. |
| 517.50 | 668.00 | -180. |
| 519.00 | 669.00 | -180. |
| 520.50 | 670.00 | -180. |
| 522.00 | 671.00 | -181. |
| 523.50 | 672.00 | -181. |
| 525.00 | 673.00 | -181. |
| 526.50 | 674.00 | -181. |
| 528.00 | 675.00 | -182. |
| 529.50 | 676.00 | -187. |
| 531.00 | 677.00 | -227. |

KINETIC ***81.15.10.14.2 GULF ATS

| | | |
|---|---|---|
| 532.50 | 678.00 | -244. |
| 534.00 | 679.00 | -243. |
| 535.50 | 680.00 | -238. |
| 537.00 | 681.00 | -237. |
| 538.50 | 682.00 | -235. |
| 540.00 | 683.00 | -233. |
| 541.50 | 684.00 | -233. |
| 543.00 | 685.00 | -231. |
| 544.50 | 686.00 | -229. |
| 546.00 | 687.00 | -228. |
| 547.50 | 688.00 | -227. |
| 549.00 | 689.00 | -225. |
| 550.50 | 690.00 | -225. |
| 552.00 | 591.00 | -225. |


KINETIC **81.15.10.14.2 GULF ATS
GRAPH OF RAW DATA
XMIN = .3240000E+03
XMAX = .6900000E+03
YMIN = -.2440000E+03
YMAX = .2310000E+03

KINETIC ***81.15.10.14.2 GULF ATS

MAXIMUM ORDINATE= 231.0 OCCURS AT 530.00 DEG KELVIN.

PEAK SEARCH LIMITS: START PT.= 340.0 STOP PT.= 650.0 DEG. KELVIN

THE PEAK ENDS AT 255 POINTS FROM START. THE Y AT THIS POINT IS -165.48
THE BASELINE EQUATION IS Y= -.34136E+00*X+ -.78433E+02

THE PEAK STARTS AT 136 POINTS FROM THE START. THE Y AT THIS POINT IS -165.12
THE BASELINE EQUATION IS Y= .51382E-01*X+ -.17211E+03

PEAK BEGINS AT 458.00 DEG KELVIN (PEAK HEIGHT =-165.17) (DATA PT. 135)
PEAK ENDS AT 578.00 DEG KELVIN (PEAK HEIGHT =-165.48) (DATA PT. 255)

NUMBER OF POINTS IN PEAK= 120

BASELINE SHIFT COMPENSATED IS -17.09

TEMPERATURES HAVE NOW BEEN CORRECTED FOR THERMAL LAG, SCAN RATE EFFECT,AND CALIBRATION ERROR.
MAGNITUDE OF THE CORRECTION AT MAXIMUM ORDINATE IS: -.69

**********************************************************************************************

********** 81.15.10.14.3 GULF ATS *****

**********************************************************************************************

WEIGHT(MG) OF SAMPLE= 4.23
RANGE(MILLICAL/SEC FULL SCALE)=, 10.0
SCAN RATE(DEG PER MINUTE(= 20.0
TEMPERATURE(DEG KELVIN) OF FIRST POINT ON DATA TAPE= 324.00

DATA RATE (SECONDS PER DATA POINT)= 3.0000

| X (SECONDS) | TEMPERATURE (KELVINS) | ORIGINAL Y (E.U.) |
|---|---|---|
| 3.00 | 324.00 | -367. |
| 6.00 | 325.00 | -368. |
| 9.00 | 326.00 | -373. |
| 12.00 | 327.00 | -375. |
| 15.00 | 328.00 | -374. |
| 18.00 | 329.00 | -373. |
| 21.00 | 330.00 | -370. |
| 24.00 | 331.00 | -369. |
| 27.00 | 332.00 | -368. |
| 30.00 | 333.00 | -367. |
| 33.00 | 334.00 | -368. |
| 36.00 | 335.00 | -367. |

KINETIC ***81.15.10.14.3 GULF ATS

| | | |
|---|---|---|
| 39.00 | 336.00 | -367. |
| 42.00 | 337.00 | -366. |
| 45.00 | 338.00 | -368. |
| 48.00 | 339.00 | -367. |
| 51.00 | 340.00 | -367. |
| 54.00 | 341.00 | -365. |
| 57.00 | 342.00 | -367. |
| 60.00 | 343.00 | -368. |
| 63.00 | 344.00 | -369. |
| 66.00 | 345.00 | -370. |
| 69.00 | 346.00 | -369. |
| 72.00 | 347.00 | -368. |
| 75.00 | 348.00 | -367. |
| 78.00 | 349.00 | -367. |
| 81.00 | 350.00 | -367. |
| 84.00 | 351.00 | -365. |
| 87.00 | 352.00 | -366. |
| 90.00 | 353.00 | -367. |
| 93.00 | 354.00 | -365. |
| 96.00 | 355.00 | -365. |
| 99.00 | 356.00 | -367. |
| 102.00 | 357.00 | -367. |
| 105.00 | 358.00 | -366. |
| 108.00 | 359.00 | -366. |
| 111.00 | 360.00 | -367. |
| 114.00 | 361.00 | -368. |
| 117.00 | 362.00 | -366. |
| 120.00 | 363.00 | -365. |
| 123.00 | 364.00 | -365. |
| 126.00 | 365.00 | -364. |
| 129.00 | 366.00 | -366. |
| 132.00 | 367.00 | -367. |
| 135.00 | 368.00 | -365. |
| 138.00 | 369.00 | -366. |
| 141.00 | 370.00 | -362. |
| 144.00 | 371.00 | -361. |
| 147.00 | 372.00 | -362. |
| 150.00 | 373.00 | -362. |
| 153.00 | 374.00 | -363. |
| 156.00 | 375.00 | -361. |
| 159.00 | 376.00 | -361. |
| 162.00 | 377.00 | -360. |
| 165.00 | 378.00 | -358. |
| 168.00 | 379.00 | -357. |
| 171.00 | 380.00 | -357. |
| 174.00 | 381.00 | -358. |
| 177.00 | 382.00 | -356. |
| 180.00 | 383.00 | -358. |
| 183.00 | 384.00 | -357. |
| 186.00 | 385.00 | -356. |
| 189.00 | 386.00 | -357. |
| 192.00 | 387.00 | -358. |
| 195.00 | 388.00 | -356. |
| 198.00 | 389.00 | -355. |
| 201.00 | 390.00 | -355. |
| 204.00 | 391.00 | -353. |
| 207.00 | 392.00 | -352. |

KINETIC ***81.15.10.14.3 GULF ATS

| | | |
|---|---|---|
| 210.00 | 393.00 | -350. |
| 213.00 | 394.00 | -351. |
| 216.00 | 395.00 | -354. |
| 219.00 | 396.00 | -353. |
| 222.00 | 397.00 | -352. |
| 225.00 | 398.00 | -352. |
| 228.00 | 399.00 | -352. |
| 231.00 | 400.00 | -353. |
| 234.00 | 401.00 | -352. |
| 237.00 | 402.00 | -351. |
| 240.00 | 403.00 | -351. |
| 243.00 | 404.00 | -351. |
| 246.00 | 405.00 | -351. |
| 249.00 | 406.00 | -350. |
| 252.00 | 407.00 | -349. |
| 255.00 | 408.00 | -350. |
| 258.00 | 409.00 | -348. |
| 261.00 | 410.00 | -349. |
| 264.00 | 411.00 | -348. |
| 267.00 | 412.00 | -347. |
| 270.00 | 413.00 | -347. |
| 273.00 | 414.00 | -347. |
| 276.00 | 415.00 | -346. |
| 279.00 | 416.00 | -344. |
| 282.00 | 417.00 | -345. |
| 285.00 | 418.00 | -344. |
| 288.00 | 419.00 | -343. |
| 291.00 | 420.00 | -341. |
| 294.00 | 421.00 | -340. |
| 297.00 | 422.00 | -340. |
| 300.00 | 423.00 | -341. |
| 303.00 | 424.00 | -340. |
| 306.00 | 425.00 | -340. |
| 309.00 | 426.00 | -342. |
| 312.00 | 427.00 | -336. |
| 315.00 | 428.00 | -340. |
| 318.00 | 429.00 | -340. |
| 321.00 | 430.00 | -340. |
| 324.00 | 431.00 | -340. |
| 327.00 | 432.00 | -337. |
| 330.00 | 433.00 | -334. |
| 333.00 | 434.00 | -333. |
| 336.00 | 435.00 | -334. |
| 339.00 | 436.00 | -334. |
| 342.00 | 437.00 | -332. |
| 345.00 | 438.00 | -332. |
| 348.00 | 439.00 | -332. |
| 351.00 | 440.00 | -332. |
| 354.00 | 441.00 | -331. |
| 357.00 | 442.00 | -331. |
| 360.00 | 443.00 | -330. |
| 363.00 | 444.00 | -330. |
| 366.00 | 445.00 | -328. |
| 369.00 | 446.00 | -326. |
| 372.00 | 447.00 | -325. |
| 375.00 | 448.00 | -324. |
| 378.00 | 449.00 | -323. |

KINETIC ***81.15.10.14.3 GULF ATS

| | | |
|---|---|---|
| 381.00 | 450.00 | -323. |
| 384.00 | 451.00 | -323. |
| 387.00 | 452.00 | -319. |
| 390.00 | 453.00 | -317. |
| 393.00 | 454.00 | -314. |
| 396.00 | 455.00 | -313. |
| 399.00 | 456.00 | -312. |
| 402.00 | 457.00 | -310. |
| 405.00 | 458.00 | -309. |
| 408.00 | 459.00 | -308. |
| 411.00 | 460.00 | -306. |
| 414.00 | 461.00 | -305. |
| 417.00 | 462.00 | -302. |
| 420.00 | 463.00 | -301. |
| 423.00 | 464.00 | -300. |
| 426.00 | 465.00 | -297. |
| 429.00 | 466.00 | -293. |
| 432.00 | 467.00 | -290. |
| 435.00 | 468.00 | -287. |
| 438.00 | 469.00 | -284. |
| 441.00 | 470.00 | -279. |
| 444.00 | 471.00 | -277. |
| 447.00 | 472.00 | -274. |
| 450.00 | 473.00 | -270. |
| 453.00 | 474.00 | -265. |
| 456.00 | 475.00 | -263. |
| 459.00 | 476.00 | -258. |
| 462.00 | 477.00 | -253. |
| 465.00 | 478.00 | -248. |
| 468.00 | 479.00 | -245. |
| 471.00 | 480.00 | -238. |
| 474.00 | 481.00 | -235. |
| 477.00 | 482.00 | -227. |
| 480.00 | 483.00 | -219. |
| 483.00 | 484.00 | -213. |
| 486.00 | 485.00 | -206. |
| 489.00 | 486.00 | -199. |
| 492.00 | 487.00 | -192. |
| 495.00 | 488.00 | -183. |
| 498.00 | 489.00 | -176. |
| 501.00 | 490.00 | -167. |
| 504.00 | 491.00 | -161. |
| 507.00 | 492.00 | -153. |
| 510.00 | 493.00 | -143. |
| 513.00 | 494.00 | -130. |
| 516.00 | 495.00 | -120. |
| 519.00 | 496.00 | -111. |
| 522.00 | 497.00 | -100. |
| 525.00 | 498.00 | -88. |
| 528.00 | 499.00 | -75. |
| 531.00 | 500.00 | -63. |
| 534.00 | 501.00 | -51. |
| 537.00 | 502.00 | -38. |
| 540.00 | 503.00 | -23. |
| 543.00 | 504.00 | -11. |
| 546.00 | 505.00 | 3. |
| 549.00 | 506.00 | 15. |

KINETIC ***81.15.10.14.3 GULF ATS

| | | |
|---|---|---|
| 552.00 | 507.00 | 30. |
| 555.00 | 508.00 | 44. |
| 558.00 | 509.00 | 57. |
| 561.00 | 510.00 | 70. |
| 564.00 | 511.00 | 82. |
| 567.00 | 512.00 | 94. |
| 570.00 | 513.00 | 101. |
| 573.00 | 514.00 | 104. |
| 576.00 | 515.00 | 107. |
| 579.00 | 516.00 | 99. |
| 582.00 | 517.00 | 91. |
| 585.00 | 518.00 | 79. |
| 588.00 | 519.00 | 62. |
| 591.00 | 520.00 | 37. |
| 594.00 | 521.00 | 13. |
| 597.00 | 522.00 | -16. |
| 600.00 | 523.00 | -43. |
| 603.00 | 524.00 | -71. |
| 606.00 | 525.00 | -94. |
| 609.00 | 526.00 | -117. |
| 612.00 | 527.00 | -138. |
| 615.00 | 528.00 | -157. |
| 618.00 | 529.00 | -174. |
| 621.00 | 530.00 | -190. |
| 624.00 | 531.00 | -203. |
| 627.00 | 532.00 | -215. |
| 630.00 | 533.00 | -223. |
| 633.00 | 534.00 | -233. |
| 636.00 | 535.00 | -236. |
| 639.00 | 536.00 | -247. |
| 642.00 | 537.00 | -250. |
| 645.00 | 538.00 | -254. |
| 648.00 | 539.00 | -258. |
| 651.00 | 540.00 | -263. |
| 654.00 | 541.00 | -268. |
| 657.00 | 542.00 | -270. |
| 660.00 | 543.00 | -274. |
| 663.00 | 544.00 | -280. |
| 666.00 | 545.00 | -281. |
| 669.00 | 546.00 | -284. |
| 672.00 | 547.00 | -289. |
| 675.00 | 548.00 | -289. |
| 678.00 | 549.00 | -290. |
| 681.00 | 550.00 | -293. |
| 684.00 | 551.00 | -292. |
| 687.00 | 552.00 | -298. |
| 690.00 | 553.00 | -300. |
| 693.00 | 554.00 | -300. |
| 696.00 | 555.00 | -301. |
| 699.00 | 556.00 | -302. |
| 702.00 | 557.00 | -303. |
| 705.00 | 558.00 | -304. |
| 708.00 | 559.00 | -306. |
| 711.00 | 560.00 | -304. |
| 714.00 | 561.00 | -304. |
| 717.00 | 562.00 | -306. |
| 720.00 | 563.00 | -305. |

KINETIC ***81.15.10.14.3 GULF ATS

| | | |
|---|---|---|
| 723.00 | 564.00 | -306. |
| 726.00 | 565.00 | -308. |
| 729.00 | 566.00 | -310. |
| 732.00 | 567.00 | -310. |
| 735.00 | 568.00 | -311. |
| 738.00 | 569.00 | -310. |
| 741.00 | 570.00 | -312. |
| 744.00 | 571.00 | -313. |
| 747.00 | 572.00 | -313. |
| 750.00 | 573.00 | -313. |
| 753.00 | 574.00 | -314. |
| 756.00 | 575.00 | -315. |
| 759.00 | 576.00 | -317. |
| 762.00 | 577.00 | -317. |
| 765.00 | 578.00 | -317. |
| 768.00 | 579.00 | -316. |
| 771.00 | 580.00 | -316. |
| 774.00 | 581.00 | -317. |
| 777.00 | 582.00 | -318. |
| 780.00 | 583.00 | -318. |
| 783.00 | 584.00 | -318. |
| 786.00 | 585.00 | -319. |
| 789.00 | 586.00 | -319. |
| 792.00 | 587.00 | -317. |
| 795.00 | 588.00 | -320. |
| 798.00 | 589.00 | -320. |
| 801.00 | 590.00 | -320. |
| 804.00 | 591.00 | -320. |
| 807.00 | 592.00 | -323. |
| 810.00 | 593.00 | -323. |
| 813.00 | 594.00 | -325. |
| 816.00 | 595.00 | -325. |
| 819.00 | 596.00 | -326. |
| 822.00 | 597.00 | -325. |
| 825.00 | 598.00 | -326. |
| 828.00 | 599.00 | -327. |
| 831.00 | 600.00 | -325. |
| 834.00 | 601.00 | -328. |
| 837.00 | 602.00 | -326. |
| 840.00 | 603.00 | -327. |
| 843.00 | 604.00 | -327. |
| 846.00 | 605.00 | -326. |
| 849.00 | 606.00 | -326. |
| 852.00 | 607.00 | -326. |
| 855.00 | 608.00 | -326. |
| 858.00 | 609.00 | -324. |
| 861.00 | 610.00 | -328. |
| 864.00 | 611.00 | -326. |
| 867.00 | 612.00 | -328. |
| 870.00 | 613.00 | -328. |
| 873.00 | 614.00 | -326. |
| 876.00 | 615.00 | -327. |
| 879.00 | 616.00 | -327. |
| 882.00 | 617.00 | -325. |
| 885.00 | 618.00 | -327. |
| 888.00 | 619.00 | -326. |
| 891.00 | 620.00 | -325. |

KINETIC ***81.15.10.14.3 GULF ATS

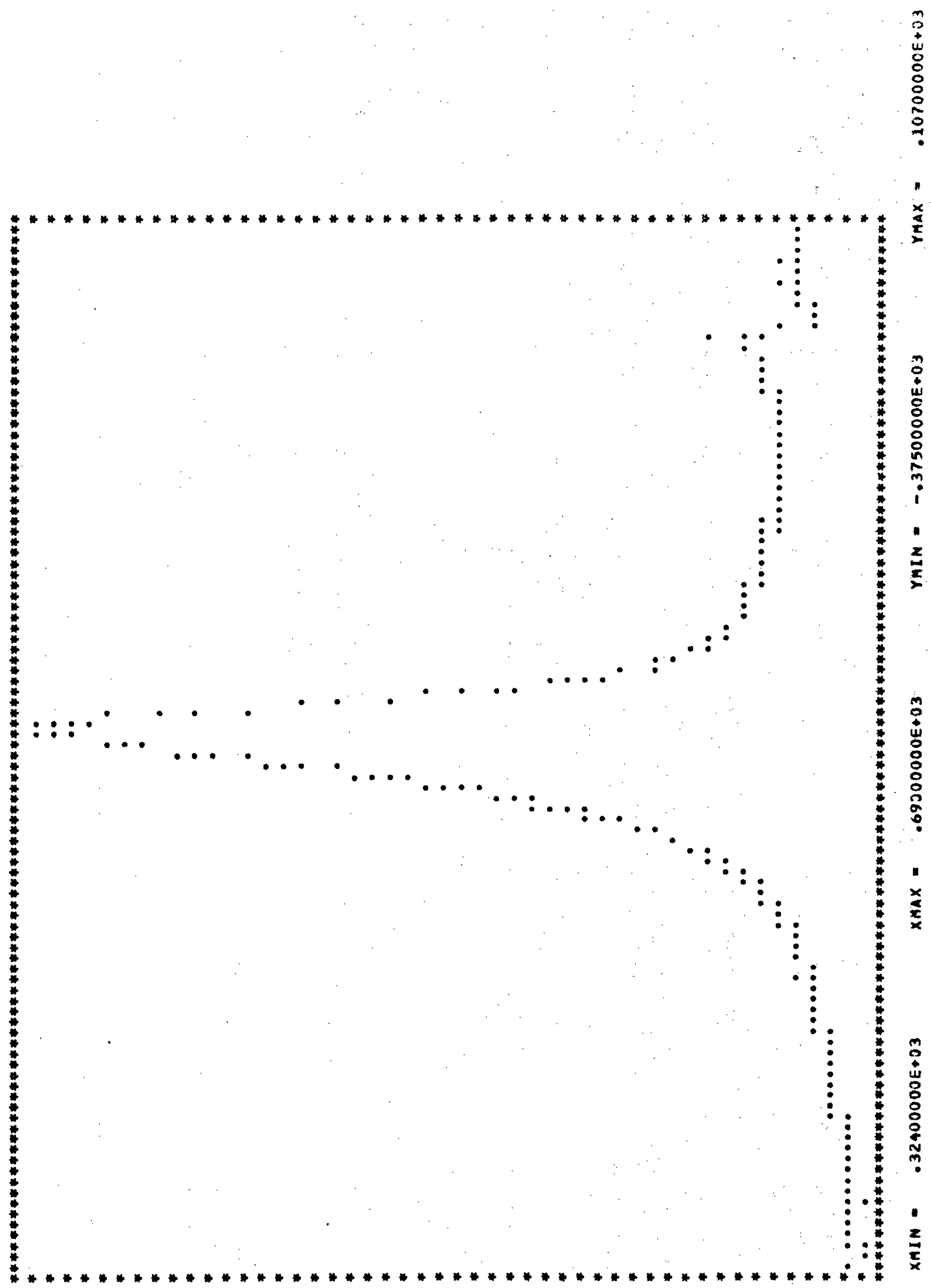
| | | |
|---|---|---|
| 894.00 | 621.00 | -325. |
| 897.00 | 622.00 | -325. |
| 900.00 | 623.00 | -323. |
| 903.00 | 624.00 | -322. |
| 906.00 | 625.00 | -322. |
| 909.00 | 626.00 | -321. |
| 912.00 | 627.00 | -320. |
| 915.00 | 628.00 | -320. |
| 918.00 | 629.00 | -320. |
| 921.00 | 630.00 | -320. |
| 924.00 | 631.00 | -320. |
| 927.00 | 632.00 | -317. |
| 930.00 | 633.00 | -320. |
| 933.00 | 634.00 | -319. |
| 936.00 | 635.00 | -318. |
| 939.00 | 636.00 | -316. |
| 942.00 | 637.00 | -318. |
| 945.00 | 638.00 | -315. |
| 948.00 | 639.00 | -313. |
| 951.00 | 640.00 | -316. |
| 954.00 | 641.00 | -313. |
| 957.00 | 642.00 | -312. |
| 960.00 | 643.00 | -310. |
| 963.00 | 644.00 | -310. |
| 966.00 | 645.00 | -309. |
| 969.00 | 646.00 | -309. |
| 972.00 | 647.00 | -307. |
| 975.00 | 648.00 | -307. |
| 978.00 | 649.00 | -306. |
| 981.00 | 650.00 | -305. |
| 984.00 | 651.00 | -309. |
| 987.00 | 652.00 | -307. |
| 990.00 | 653.00 | -308. |
| 993.00 | 654.00 | -286. |
| 996.00 | 655.00 | -319. |
| 999.00 | 656.00 | -347. |
| 1002.00 | 657.00 | -348. |
| 1005.00 | 658.00 | -346. |
| 1008.00 | 659.00 | -343. |
| 1011.00 | 660.00 | -342. |
| 1014.00 | 661.00 | -342. |
| 1017.00 | 662.00 | -341. |
| 1020.00 | 663.00 | -336. |
| 1023.00 | 664.00 | -336. |
| 1026.00 | 665.00 | -334. |
| 1029.00 | 666.00 | -333. |
| 1032.00 | 667.00 | -332. |
| 1035.00 | 668.00 | -331. |
| 1038.00 | 669.00 | -333. |
| 1041.00 | 670.00 | -331. |
| 1044.00 | 671.00 | -329. |
| 1047.00 | 672.00 | -328. |
| 1050.00 | 673.00 | -330. |
| 1053.00 | 674.00 | -329. |
| 1056.00 | 675.00 | -329. |
| 1059.00 | 676.00 | -329. |
| 1062.00 | 677.00 | -328. |

KINETIC ***81.15.10.14.3 GULF ATS

| | | |
|---|---|---|
| 1065.00 | 678.00 | -330. |
| 1068.00 | 679.00 | -333. |
| 1071.00 | 680.00 | -335. |
| 1074.00 | 681.00 | -334. |
| 1077.00 | 682.00 | -337. |
| 1080.00 | 683.00 | -335. |
| 1083.00 | 684.00 | -335. |
| 1086.00 | 685.00 | -336. |
| 1089.00 | 686.00 | -336. |
| 1092.00 | 687.00 | -336. |
| 1095.00 | 688.00 | -335. |
| 1098.00 | 689.00 | -333. |
| 1101.00 | 690.00 | -335. |
| 1104.00 | 691.00 | -337. |

KINETIC ***81.15.10.14.3 GULF ATS

GRAPH OF RAW DATA



KINETIC ***81.15.10.14.3 GULF ATS

MAXIMUM ORDINATE= 107.0 OCCURS AT 515.00 DEG KELVIN.

PEAK SEARCH LIMITS: START PT.= 396.0 STOP PT.= 620.0 DEG. KELVIN

THE PEAK ENDS AT 233 POINTS FROM START. THE Y AT THIS POINT IS -305.87
THE BASELINE EQUATION IS Y= -.39939E+00*X+ -.21281E+03

THE PEAK STARTS AT 130 POINTS FROM THE START. THE Y AT THIS POINT IS -323.01
THE BASELINE EQUATION IS Y= .57489E+00*X+ -.39775E+03

PEAK BEGINS AT 452.00 DEG KELVIN (PEAK HEIGHT =-323.59) (DATA PT. 129)
PEAK ENDS AT 556.00 DEG KELVIN (PEAK HEIGHT =-305.87) (DATA PT. 233)

NUMBER OF POINTS IN PEAK= 104

BASELINE SHIFT COMPENSATED IS -8.60

TEMPERATURES HAVE NOW BEEN CORRECTED FOR THERMAL LAG, SCAN RATE EFFECT,AND CALIBRATION ERROR.
MAGNITUDE OF THE CORRECTION AT MAXIMUM ORDINATE IS: -.23

*****************************************************************************************************

********** 81.11.8.21.7 GULF ATS *****

*****************************************************************************************************

WEIGHT(MG) OF SAMPLE= 7.35
RANGE(MILLICAL/SEC FULL SCALE)=, 10.0
SCAN RATE(DEG PER MINUTE(= 10.0
TEMPERATURE(DEG KELVIN) OF FIRST POINT ON DATA TAPE= 324.00

DATA RATE (SECONDS PER DATA POINT)= 6.0000

| X (SECONDS) | TEMPERATURE (KELVINS) | ORIGINAL Y (E.U.) |
|---|---|---|
| 6.00 | 324.00 | -106. |
| 12.00 | 325.00 | -103. |
| 18.00 | 326.00 | -118. |
| 24.00 | 327.00 | -119. |
| 30.00 | 328.00 | -128. |
| 36.00 | 329.00 | -127. |
| 42.00 | 330.00 | -127. |
| 48.00 | 331.00 | -129. |
| 54.00 | 332.00 | -129. |
| 60.00 | 333.00 | -128. |
| 66.00 | 334.00 | -129. |
| 72.00 | 335.00 | -131. |

KINETIC ***81.11.8.21.7 GULF ATS

| | | |
|---|---|---|
| 78.00 | 336.00 | -129. |
| 84.00 | 337.00 | -130. |
| 90.00 | 338.00 | -129. |
| 96.00 | 339.00 | -129. |
| 102.00 | 340.00 | -127. |
| 108.00 | 341.00 | -130. |
| 114.00 | 342.00 | -129. |
| 120.00 | 343.00 | -131. |
| 126.00 | 344.00 | -130. |
| 132.00 | 345.00 | -129. |
| 138.00 | 346.00 | -129. |
| 144.00 | 347.00 | -129. |
| 150.00 | 348.00 | -133. |
| 156.00 | 349.00 | -128. |
| 162.00 | 350.00 | -127. |
| 168.00 | 351.00 | -132. |
| 174.00 | 352.00 | -129. |
| 180.00 | 353.00 | -131. |
| 186.00 | 354.00 | -129. |
| 192.00 | 355.00 | -128. |
| 198.00 | 356.00 | -130. |
| 204.00 | 357.00 | -130. |
| 210.00 | 358.00 | -127. |
| 216.00 | 359.00 | -131. |
| 222.00 | 360.00 | -131. |
| 228.00 | 361.00 | -130. |
| 234.00 | 362.00 | -132. |
| 240.00 | 363.00 | -138. |
| 246.00 | 364.00 | -128. |
| 252.00 | 365.00 | -127. |
| 258.00 | 366.00 | -129. |
| 264.00 | 367.00 | -131. |
| 270.00 | 368.00 | -129. |
| 276.00 | 369.00 | -121. |
| 282.00 | 370.00 | -129. |
| 288.00 | 371.00 | -132. |
| 294.00 | 372.00 | -128. |
| 300.00 | 373.00 | -129. |
| 306.00 | 374.00 | -129. |
| 312.00 | 375.00 | -129. |
| 318.00 | 376.00 | -119. |
| 324.00 | 377.00 | -131. |
| 330.00 | 378.00 | -129. |
| 336.00 | 379.00 | -131. |
| 342.00 | 380.00 | -131. |
| 348.00 | 381.00 | -130. |
| 354.00 | 382.00 | -131. |
| 360.00 | 383.00 | -138. |
| 366.00 | 384.00 | -132. |
| 372.00 | 385.00 | -133. |
| 378.00 | 386.00 | -131. |
| 384.00 | 387.00 | -131. |
| 390.00 | 388.00 | -132. |
| 396.00 | 389.00 | -133. |
| 402.00 | 390.00 | -132. |
| 408.00 | 391.00 | -138. |
| 414.00 | 392.00 | -131. |

KINETIC ***81.11.8.21.7 GULF ATS

| | | |
|---|---|---|
| 420.00 | 393.00 | -130. |
| 426.00 | 394.00 | -131. |
| 432.00 | 395.00 | -132. |
| 438.00 | 396.00 | -131. |
| 444.00 | 397.00 | -133. |
| 450.00 | 398.00 | -131. |
| 456.00 | 399.00 | -130. |
| 462.00 | 400.00 | -130. |
| 468.00 | 401.00 | -130. |
| 474.00 | 402.00 | -123. |
| 480.00 | 403.00 | -127. |
| 486.00 | 404.00 | -128. |
| 492.00 | 405.00 | -129. |
| 498.00 | 406.00 | -127. |
| 504.00 | 407.00 | -127. |
| 510.00 | 408.00 | -127. |
| 516.00 | 409.00 | -119. |
| 522.00 | 410.00 | -128. |
| 528.00 | 411.00 | -129. |
| 534.00 | 412.00 | -129. |
| 540.00 | 413.00 | -128. |
| 546.00 | 414.00 | -126. |
| 552.00 | 415.00 | -122. |
| 558.00 | 416.00 | -125. |
| 564.00 | 417.00 | -125. |
| 570.00 | 418.00 | -125. |
| 576.00 | 419.00 | -124. |
| 582.00 | 420.00 | -123. |
| 588.00 | 421.00 | -130. |
| 594.00 | 422.00 | -122. |
| 600.00 | 423.00 | -122. |
| 606.00 | 424.00 | -119. |
| 612.00 | 425.00 | -121. |
| 618.00 | 426.00 | -119. |
| 624.00 | 427.00 | -124. |
| 630.00 | 428.00 | -114. |
| 636.00 | 429.00 | -117. |
| 642.00 | 430.00 | -117. |
| 648.00 | 431.00 | -117. |
| 654.00 | 432.00 | -119. |
| 660.00 | 433.00 | -115. |
| 666.00 | 434.00 | -113. |
| 672.00 | 435.00 | -119. |
| 678.00 | 436.00 | -110. |
| 684.00 | 437.00 | -109. |
| 690.00 | 438.00 | -110. |
| 696.00 | 439.00 | -107. |
| 702.00 | 440.00 | -108. |
| 708.00 | 441.00 | -105. |
| 714.00 | 442.00 | -103. |
| 720.00 | 443.00 | -106. |
| 726.00 | 444.00 | -104. |
| 732.00 | 445.00 | -99. |
| 738.00 | 446.00 | -97. |
| 744.00 | 447.00 | -96. |
| 750.00 | 448.00 | -93. |
| 756.00 | 449.00 | -90. |

KINETIC ***81.11.8.21.7 GULF ATS

| | | |
|---|---|---|
| 762.00 | 450.00 | -69. |
| 768.00 | 451.00 | -87. |
| 774.00 | 452.00 | -79. |
| 780.00 | 453.00 | -80. |
| 786.00 | 454.00 | -75. |
| 792.00 | 455.00 | -67. |
| 798.00 | 456.00 | -70. |
| 804.00 | 457.00 | -63. |
| 810.00 | 458.00 | -63. |
| 816.00 | 459.00 | -59. |
| 822.00 | 460.00 | -53. |
| 828.00 | 461.00 | -47. |
| 834.00 | 462.00 | -43. |
| 840.00 | 463.00 | -41. |
| 846.00 | 464.00 | -33. |
| 852.00 | 465.00 | -30. |
| 858.00 | 466.00 | -20. |
| 864.00 | 467.00 | -20. |
| 870.00 | 468.00 | -12. |
| 876.00 | 469.00 | -7. |
| 882.00 | 470.00 | -1. |
| 888.00 | 471.00 | 6. |
| 894.00 | 472.00 | 11. |
| 900.00 | 473.00 | 20. |
| 906.00 | 474.00 | 30. |
| 912.00 | 475.00 | 38. |
| 918.00 | 476.00 | 39. |
| 924.00 | 477.00 | 58. |
| 930.00 | 478.00 | 63. |
| 936.00 | 479.00 | 72. |
| 942.00 | 480.00 | 83. |
| 948.00 | 481.00 | 94. |
| 954.00 | 482.00 | 100. |
| 960.00 | 483.00 | 119. |
| 966.00 | 484.00 | 132. |
| 972.00 | 485.00 | 142. |
| 978.00 | 486.00 | 159. |
| 984.00 | 487.00 | 167. |
| 990.00 | 488.00 | 179. |
| 996.00 | 489.00 | 199. |
| 1002.00 | 490.00 | 214. |
| 1008.00 | 491.00 | 230. |
| 1014.00 | 492.00 | 246. |
| 1020.00 | 493.00 | 256. |
| 1026.00 | 494.00 | 269. |
| 1032.00 | 495.00 | 278. |
| 1038.00 | 496.00 | 279. |
| 1044.00 | 497.00 | 279. |
| 1050.00 | 498.00 | 278. |
| 1056.00 | 499.00 | 265. |
| 1062.00 | 500.00 | 247. |
| 1068.00 | 501.00 | 222. |
| 1074.00 | 502.00 | 200. |
| 1080.00 | 503.00 | 172. |
| 1086.00 | 504.00 | 139. |
| 1092.00 | 505.00 | 115. |
| 1098.00 | 506.00 | 87. |

KINETIC ***81.11.8.21.7 GULF ATS

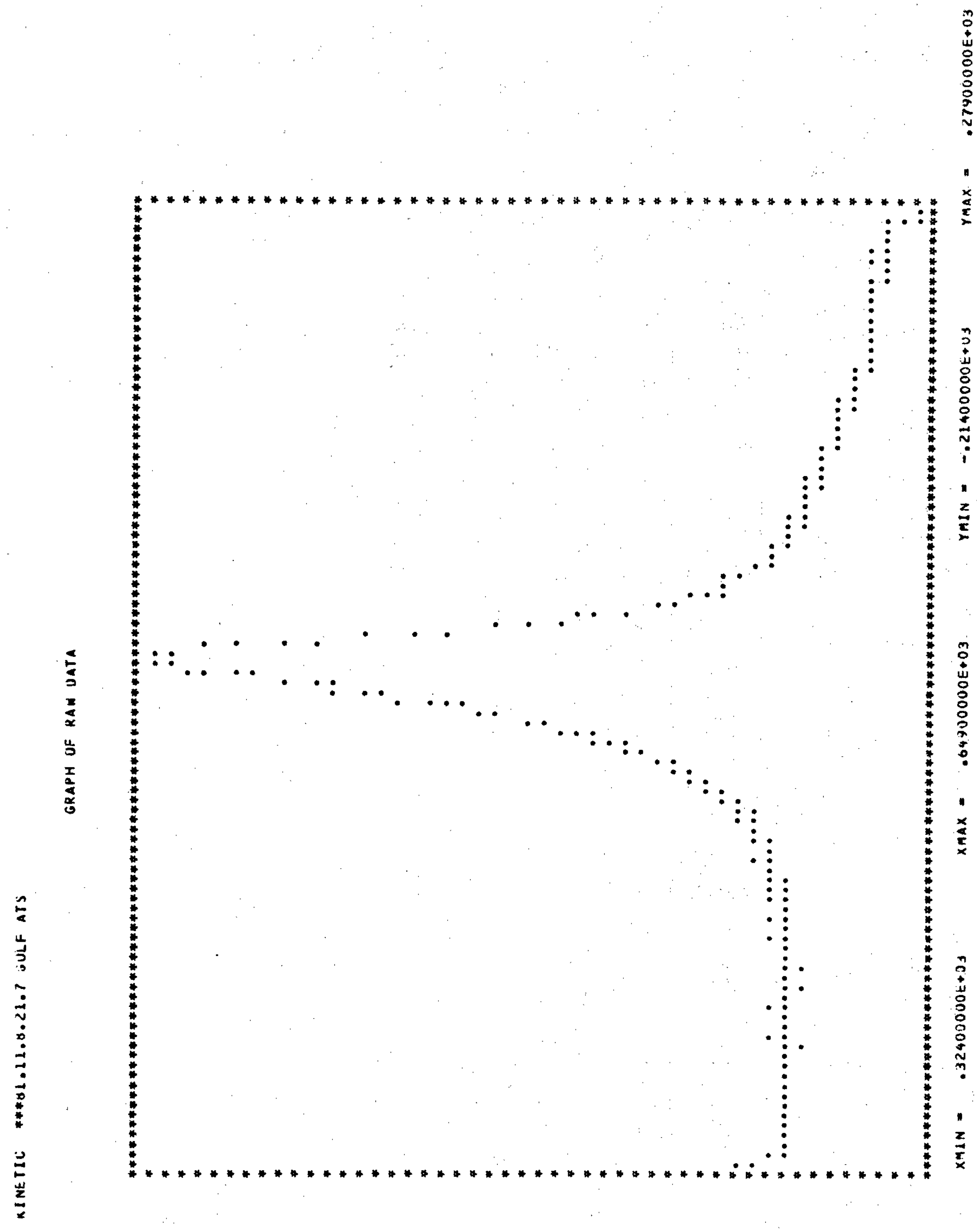
| | | |
|---|---|---|
| 1104.00 | 507.00 | 60. |
| 1110.00 | 508.00 | 39. |
| 1116.00 | 509.00 | 18. |
| 1122.00 | 510.00 | 8. |
| 1128.00 | 511.00 | -9. |
| 1134.00 | 512.00 | -22. |
| 1140.00 | 513.00 | -27. |
| 1146.00 | 514.00 | -43. |
| 1152.00 | 515.00 | -49. |
| 1158.00 | 516.00 | -60. |
| 1164.00 | 517.00 | -67. |
| 1170.00 | 518.00 | -71. |
| 1176.00 | 519.00 | -77. |
| 1182.00 | 520.00 | -83. |
| 1188.00 | 521.00 | -85. |
| 1194.00 | 522.00 | -90. |
| 1200.00 | 523.00 | -93. |
| 1206.00 | 524.00 | -89. |
| 1212.00 | 525.00 | -101. |
| 1218.00 | 526.00 | -99. |
| 1224.00 | 527.00 | -107. |
| 1230.00 | 528.00 | -108. |
| 1236.00 | 529.00 | -120. |
| 1242.00 | 530.00 | -107. |
| 1248.00 | 531.00 | -118. |
| 1254.00 | 532.00 | -115. |
| 1260.00 | 533.00 | -120. |
| 1266.00 | 534.00 | -121. |
| 1272.00 | 535.00 | -123. |
| 1278.00 | 536.00 | -125. |
| 1284.00 | 537.00 | -125. |
| 1290.00 | 538.00 | -126. |
| 1296.00 | 539.00 | -129. |
| 1302.00 | 540.00 | -129. |
| 1308.00 | 541.00 | -130. |
| 1314.00 | 542.00 | -133. |
| 1320.00 | 543.00 | -138. |
| 1326.00 | 544.00 | -135. |
| 1332.00 | 545.00 | -137. |
| 1338.00 | 546.00 | -138. |
| 1344.00 | 547.00 | -138. |
| 1350.00 | 548.00 | -137. |
| 1356.00 | 549.00 | -139. |
| 1362.00 | 550.00 | -144. |
| 1368.00 | 551.00 | -141. |
| 1374.00 | 552.00 | -143. |
| 1380.00 | 553.00 | -140. |
| 1386.00 | 554.00 | -139. |
| 1392.00 | 555.00 | -147. |
| 1398.00 | 556.00 | -143. |
| 1404.00 | 557.00 | -147. |
| 1410.00 | 558.00 | -139. |
| 1416.00 | 559.00 | -147. |
| 1422.00 | 560.00 | -152. |
| 1428.00 | 561.00 | -152. |
| 1434.00 | 562.00 | -153. |
| 1440.00 | 563.00 | -153. |

KINETIC ***81.11.8.21.7 GULF ATS

| | | |
|---|---|---|
| 1446.00 | 564.00 | -153. |
| 1452.00 | 565.00 | -153. |
| 1458.00 | 566.00 | -155. |
| 1464.00 | 567.00 | -155. |
| 1470.00 | 568.00 | -158. |
| 1476.00 | 569.00 | -157. |
| 1482.00 | 570.00 | -157. |
| 1488.00 | 571.00 | -160. |
| 1494.00 | 572.00 | -158. |
| 1500.00 | 573.00 | -158. |
| 1506.00 | 574.00 | -161. |
| 1512.00 | 575.00 | -162. |
| 1518.00 | 576.00 | -161. |
| 1524.00 | 577.00 | -163. |
| 1530.00 | 578.00 | -163. |
| 1536.00 | 579.00 | -165. |
| 1542.00 | 580.00 | -166. |
| 1548.00 | 581.00 | -168. |
| 1554.00 | 582.00 | -167. |
| 1560.00 | 583.00 | -166. |
| 1566.00 | 584.00 | -168. |
| 1572.00 | 585.00 | -170. |
| 1578.00 | 586.00 | -169. |
| 1584.00 | 587.00 | -163. |
| 1590.00 | 588.00 | -173. |
| 1596.00 | 589.00 | -173. |
| 1602.00 | 590.00 | -174. |
| 1608.00 | 591.00 | -175. |
| 1614.00 | 592.00 | -174. |
| 1620.00 | 593.00 | -175. |
| 1626.00 | 594.00 | -170. |
| 1632.00 | 595.00 | -177. |
| 1638.00 | 596.00 | -180. |
| 1644.00 | 597.00 | -179. |
| 1650.00 | 598.00 | -180. |
| 1656.00 | 599.00 | -179. |
| 1662.00 | 600.00 | -179. |
| 1668.00 | 601.00 | -179. |
| 1674.00 | 602.00 | -182. |
| 1680.00 | 603.00 | -179. |
| 1686.00 | 604.00 | -179. |
| 1692.00 | 605.00 | -183. |
| 1698.00 | 606.00 | -180. |
| 1704.00 | 607.00 | -182. |
| 1710.00 | 608.00 | -185. |
| 1716.00 | 609.00 | -185. |
| 1722.00 | 610.00 | -181. |
| 1728.00 | 611.00 | -186. |
| 1734.00 | 612.00 | -183. |
| 1740.00 | 613.00 | -179. |
| 1746.00 | 614.00 | -185. |
| 1752.00 | 615.00 | -187. |
| 1758.00 | 616.00 | -187. |
| 1764.00 | 617.00 | -187. |
| 1770.00 | 618.00 | -187. |
| 1776.00 | 619.00 | -183. |
| 1782.00 | 620.00 | -187. |

KINETIC ***81.11.8.21.7 GULF ATS

| | | |
|---|---|---|
| 1788.00 | 621.00 | -187. |
| 1794.00 | 622.00 | -187. |
| 1800.00 | 623.00 | -187. |
| 1806.00 | 624.00 | -183. |
| 1812.00 | 625.00 | -181. |
| 1818.00 | 626.00 | -183. |
| 1824.00 | 627.00 | -188. |
| 1830.00 | 628.00 | -190. |
| 1836.00 | 629.00 | -189. |
| 1842.00 | 630.00 | -191. |
| 1848.00 | 631.00 | -183. |
| 1854.00 | 632.00 | -191. |
| 1860.00 | 633.00 | -192. |
| 1866.00 | 634.00 | -187. |
| 1872.00 | 635.00 | -193. |
| 1878.00 | 636.00 | -193. |
| 1884.00 | 637.00 | -194. |
| 1890.00 | 638.00 | -194. |
| 1896.00 | 639.00 | -194. |
| 1902.00 | 640.00 | -193. |
| 1908.00 | 641.00 | -198. |
| 1914.00 | 642.00 | -197. |
| 1920.00 | 643.00 | -198. |
| 1926.00 | 644.00 | -198. |
| 1932.00 | 645.00 | -203. |
| 1938.00 | 646.00 | -206. |
| 1944.00 | 647.00 | -209. |
| 1950.00 | 648.00 | -214. |
| 1956.00 | 649.00 | -214. |
| 1962.00 | 650.00 | -220. |


KINETIC ***81.11.8.21.7 GULF ATS
GRAPH OF RAW DATA
XMIN = .32400000E+03
XMAX = .64900000E+03
YMIN = -.21400000E+03
YMAX = .27900000E+03

```
KINETIC  ***81.11.8.21.7 GULF ATS


MAXIMUM ORDINATE=  279.0 OCCURS AT   497.00 DEG KELVIN.

PEAK SEARCH LIMITS: START PT.=  374.0   STOP PT.=  585.0 DEG. KELVIN

    THE PEAK ENDS AT  213 POINTS FROM START. THE Y AT THIS POINT IS -127.29
    THE BASELINE EQUATION IS Y= -.88034E+00*X+  .60220E+02


    THE PEAK STARTS AT  110 POINTS FROM THE START. THE Y AT THIS POINT IS -119.98
    THE BASELINE EQUATION IS Y=  .23579E+00*X+ -.14591E+03

PEAK BEGINS AT 432.00 DEG KELVIN   (PEAK HEIGHT =-120.21) (DATA PT.  109)
PEAK ENDS AT   536.00 DEG KELVIN   (PEAK HEIGHT =-127.29) (DATA PT.  213)

NUMBER OF POINTS IN PEAK=  104

BASELINE SHIFT COMPENSATED IS  -26.44

TEMPERATURES HAVE NOW BEEN CORRECTED FOR THERMAL LAG, SCAN RATE EFFECT,AND CALIBRATION ERROR.
MAGNITUDE OF THE CORRECTION AT MAXIMUM ORDINATE IS:    .51


*****************************************************************************************************

**********     81.11.8.21.6 GULF ATS                                                            *****

*****************************************************************************************************

WEIGHT(MG) OF SAMPLE=   7.22
RANGE(MILLICAL/SEC FULL SCALE)=,  10.0
SCAN RATE(DEG PER MINUTE)=       5.0
TEMPERATURE(DEG KELVIN) OF FIRST POINT ON DATA TAPE=    323.75

DATA RATE (SECONDS PER DATA POINT)=      9.0000
```

| X (SECONDS) | TEMPERATURE (KELVINS) | ORIGINAL Y (E.U.) |
|---|---|---|
| 9.00 | 323.75 | -83. |
| 18.00 | 324.50 | -83. |
| 27.00 | 325.25 | -87. |
| 36.00 | 326.00 | -93. |
| 45.00 | 326.75 | -94. |
| 54.00 | 327.50 | -94. |
| 63.00 | 328.25 | -95. |
| 72.00 | 329.00 | -97. |
| 81.00 | 329.75 | -97. |
| 90.00 | 330.50 | -97. |
| 99.00 | 331.25 | -97. |
| 108.00 | 332.00 | -96. |

KINETIC ***81.11.8.21.6 GULF ATS

| | | |
|---|---|---|
| 117.00 | 332.75 | -95. |
| 126.00 | 333.50 | -95. |
| 135.00 | 334.25 | -93. |
| 144.00 | 335.00 | -93. |
| 153.00 | 335.75 | -93. |
| 162.00 | 336.50 | -93. |
| 171.00 | 337.25 | -93. |
| 180.00 | 338.00 | -93. |
| 189.00 | 338.75 | -95. |
| 198.00 | 339.50 | -95. |
| 207.00 | 340.25 | -95. |
| 216.00 | 341.00 | -95. |
| 225.00 | 341.75 | -95. |
| 234.00 | 342.50 | -95. |
| 243.00 | 343.25 | -95. |
| 252.00 | 344.00 | -94. |
| 261.00 | 344.75 | -93. |
| 270.00 | 345.50 | -93. |
| 279.00 | 346.25 | -93. |
| 288.00 | 347.00 | -95. |
| 297.00 | 347.75 | -94. |
| 306.00 | 348.50 | -95. |
| 315.00 | 349.25 | -93. |
| 324.00 | 350.00 | -93. |
| 333.00 | 350.75 | -93. |
| 342.00 | 351.50 | -93. |
| 351.00 | 352.25 | -93. |
| 360.00 | 353.00 | -93. |
| 369.00 | 353.75 | -93. |
| 378.00 | 354.50 | -93. |
| 387.00 | 355.25 | -93. |
| 396.00 | 356.00 | -93. |
| 405.00 | 356.75 | -93. |
| 414.00 | 357.50 | -93. |
| 423.00 | 358.25 | -93. |
| 432.00 | 359.00 | -93. |
| 441.00 | 359.75 | -93. |
| 450.00 | 360.50 | -93. |
| 459.00 | 361.25 | -93. |
| 468.00 | 362.00 | -93. |
| 477.00 | 362.75 | -92. |
| 486.00 | 363.50 | -93. |
| 495.00 | 364.25 | -92. |
| 504.00 | 365.00 | -92. |
| 513.00 | 365.75 | -92. |
| 522.00 | 366.50 | -93. |
| 531.00 | 367.25 | -92. |
| 540.00 | 368.00 | -91. |
| 549.00 | 368.75 | -92. |
| 558.00 | 369.50 | -91. |
| 567.00 | 370.25 | -89. |
| 576.00 | 371.00 | -89. |
| 585.00 | 371.75 | -89. |
| 594.00 | 372.50 | -91. |
| 603.00 | 373.25 | -91. |
| 612.00 | 374.00 | -89. |
| 621.00 | 374.75 | -89. |

KINETIC ***81.11.8.21.6 GULF ATS

| | | |
|---|---|---|
| 630.00 | 375.50 | -89. |
| 639.00 | 376.25 | -89. |
| 648.00 | 377.00 | -89. |
| 657.00 | 377.75 | -89. |
| 666.00 | 378.50 | -89. |
| 675.00 | 379.25 | -89. |
| 684.00 | 380.00 | -89. |
| 693.00 | 380.75 | -89. |
| 702.00 | 381.50 | -89. |
| 711.00 | 382.25 | -89. |
| 720.00 | 383.00 | -89. |
| 729.00 | 383.75 | -89. |
| 738.00 | 384.50 | -89. |
| 747.00 | 385.25 | -87. |
| 756.00 | 386.00 | -87. |
| 765.00 | 386.75 | -87. |
| 774.00 | 387.50 | -87. |
| 783.00 | 388.25 | -87. |
| 792.00 | 389.00 | -87. |
| 801.00 | 389.75 | -87. |
| 810.00 | 390.50 | -87. |
| 819.00 | 391.25 | -87. |
| 828.00 | 392.00 | -87. |
| 837.00 | 392.75 | -87. |
| 846.00 | 393.50 | -87. |
| 855.00 | 394.25 | -87. |
| 864.00 | 395.00 | -87. |
| 873.00 | 395.75 | -87. |
| 882.00 | 396.50 | -87. |
| 891.00 | 397.25 | -87. |
| 900.00 | 398.00 | -86. |
| 909.00 | 398.75 | -87. |
| 918.00 | 399.50 | -86. |
| 927.00 | 400.25 | -86. |
| 936.00 | 401.00 | -85. |
| 945.00 | 401.75 | -85. |
| 954.00 | 402.50 | -85. |
| 963.00 | 403.25 | -85. |
| 972.00 | 404.00 | -84. |
| 981.00 | 404.75 | -85. |
| 990.00 | 405.50 | -84. |
| 999.00 | 406.25 | -83. |
| 1008.00 | 407.00 | -84. |
| 1017.00 | 407.75 | -83. |
| 1026.00 | 408.50 | -83. |
| 1035.00 | 409.25 | -83. |
| 1044.00 | 410.00 | -83. |
| 1053.00 | 410.75 | -83. |
| 1062.00 | 411.50 | -83. |
| 1071.00 | 412.25 | -82. |
| 1080.00 | 413.00 | -79. |
| 1089.00 | 413.75 | -79. |
| 1098.00 | 414.50 | -82. |
| 1107.00 | 415.25 | -79. |
| 1116.00 | 416.00 | -79. |
| 1125.00 | 416.75 | -79. |
| 1134.00 | 417.50 | -79. |

KINETIC ***81.11.8.21.6 GULF ATS

| | | |
|---|---|---|
| 1143.00 | 418.25 | -79. |
| 1152.00 | 419.00 | -79. |
| 1161.00 | 419.75 | -79. |
| 1170.00 | 420.50 | -79. |
| 1179.00 | 421.25 | -77. |
| 1188.00 | 422.00 | -77. |
| 1197.00 | 422.75 | -77. |
| 1206.00 | 423.50 | -77. |
| 1215.00 | 424.25 | -77. |
| 1224.00 | 425.00 | -77. |
| 1233.00 | 425.75 | -75. |
| 1242.00 | 426.50 | -73. |
| 1251.00 | 427.25 | -73. |
| 1260.00 | 428.00 | -73. |
| 1269.00 | 428.75 | -73. |
| 1278.00 | 429.50 | -73. |
| 1287.00 | 430.25 | -71. |
| 1296.00 | 431.00 | -71. |
| 1305.00 | 431.75 | -69. |
| 1314.00 | 432.50 | -69. |
| 1323.00 | 433.25 | -69. |
| 1332.00 | 434.00 | -67. |
| 1341.00 | 434.75 | -67. |
| 1350.00 | 435.50 | -65. |
| 1359.00 | 436.25 | -66. |
| 1368.00 | 437.00 | -63. |
| 1377.00 | 437.75 | -63. |
| 1386.00 | 438.50 | -63. |
| 1395.00 | 439.25 | -61. |
| 1404.00 | 440.00 | -59. |
| 1413.00 | 440.75 | -59. |
| 1422.00 | 441.50 | -57. |
| 1431.00 | 442.25 | -57. |
| 1440.00 | 443.00 | -55. |
| 1449.00 | 443.75 | -55. |
| 1458.00 | 444.50 | -53. |
| 1467.00 | 445.25 | -52. |
| 1476.00 | 446.00 | -49. |
| 1485.00 | 446.75 | -47. |
| 1494.00 | 447.50 | -47. |
| 1503.00 | 448.25 | -45. |
| 1512.00 | 449.00 | -42. |
| 1521.00 | 449.75 | -39. |
| 1530.00 | 450.50 | -39. |
| 1539.00 | 451.25 | -35. |
| 1548.00 | 452.00 | -33. |
| 1557.00 | 452.75 | -33. |
| 1566.00 | 453.50 | -29. |
| 1575.00 | 454.25 | -27. |
| 1584.00 | 455.00 | -25. |
| 1593.00 | 455.75 | -22. |
| 1602.00 | 456.50 | -19. |
| 1611.00 | 457.25 | -16. |
| 1620.00 | 458.00 | -13. |
| 1629.00 | 458.75 | -9. |
| 1638.00 | 459.50 | -7. |
| 1647.00 | 460.25 | -3. |

KINETIC ***81.11.8.21.6 GULF ATS

| | | |
|---|---|---|
| 1656.00 | 461.00 | 0. |
| 1665.00 | 461.75 | 4. |
| 1674.00 | 462.50 | 8. |
| 1683.00 | 463.25 | 12. |
| 1692.00 | 464.00 | 16. |
| 1701.00 | 464.75 | 20. |
| 1710.00 | 465.50 | 24. |
| 1719.00 | 466.25 | 30. |
| 1728.00 | 467.00 | 34. |
| 1737.00 | 467.75 | 40. |
| 1746.00 | 468.50 | 43. |
| 1755.00 | 469.25 | 50. |
| 1764.00 | 470.00 | 34. |
| 1773.00 | 470.75 | 60. |
| 1782.00 | 471.50 | 66. |
| 1791.00 | 472.25 | 73. |
| 1800.00 | 473.00 | 80. |
| 1809.00 | 473.75 | 85. |
| 1818.00 | 474.50 | 92. |
| 1827.00 | 475.25 | 100. |
| 1836.00 | 476.00 | 106. |
| 1845.00 | 476.75 | 114. |
| 1854.00 | 477.50 | 121. |
| 1863.00 | 478.25 | 128. |
| 1872.00 | 479.00 | 136. |
| 1881.00 | 479.75 | 142. |
| 1890.00 | 480.50 | 147. |
| 1899.00 | 481.25 | 151. |
| 1908.00 | 482.00 | 152. |
| 1917.00 | 482.75 | 150. |
| 1926.00 | 483.50 | 144. |
| 1935.00 | 484.25 | 136. |
| 1944.00 | 485.00 | 124. |
| 1953.00 | 485.75 | 110. |
| 1962.00 | 486.50 | 96. |
| 1971.00 | 487.25 | 82. |
| 1980.00 | 488.00 | 68. |
| 1989.00 | 488.75 | 54. |
| 1998.00 | 489.50 | 40. |
| 2007.00 | 490.25 | 30. |
| 2016.00 | 491.00 | 20. |
| 2025.00 | 491.75 | 10. |
| 2034.00 | 492.50 | 2. |
| 2043.00 | 493.25 | -6. |
| 2052.00 | 494.00 | -12. |
| 2061.00 | 494.75 | -17. |
| 2070.00 | 495.50 | -22. |
| 2079.00 | 496.25 | -27. |
| 2088.00 | 497.00 | -29. |
| 2097.00 | 497.75 | -33. |
| 2106.00 | 498.50 | -37. |
| 2115.00 | 499.25 | -39. |
| 2124.00 | 500.00 | -39. |
| 2133.00 | 500.75 | -43. |
| 2142.00 | 501.50 | -45. |
| 2151.00 | 502.25 | -47. |
| 2160.00 | 503.00 | -49. |

KINETIC ***81.11.8.21.6 GULF ATS

| | | |
|---|---|---|
| 2169.00 | 503.75 | -49. |
| 2178.00 | 504.50 | -53. |
| 2187.00 | 505.25 | -53. |
| 2196.00 | 506.00 | -55. |
| 2205.00 | 506.75 | -57. |
| 2214.00 | 507.50 | -57. |
| 2223.00 | 508.25 | -57. |
| 2232.00 | 509.00 | -59. |
| 2241.00 | 509.75 | -59. |
| 2250.00 | 510.50 | -63. |
| 2259.00 | 511.25 | -62. |
| 2268.00 | 512.00 | -63. |
| 2277.00 | 512.75 | -63. |
| 2286.00 | 513.50 | -63. |
| 2295.00 | 514.25 | -65. |
| 2304.00 | 515.00 | -65. |
| 2313.00 | 515.75 | -66. |
| 2322.00 | 516.50 | -67. |
| 2331.00 | 517.25 | -67. |
| 2340.00 | 518.00 | -67. |
| 2349.00 | 518.75 | -67. |
| 2358.00 | 519.50 | -67. |
| 2367.00 | 520.25 | -69. |
| 2376.00 | 521.00 | -69. |
| 2385.00 | 521.75 | -69. |
| 2394.00 | 522.50 | -69. |
| 2403.00 | 523.25 | -69. |
| 2412.00 | 524.00 | -71. |
| 2421.00 | 524.75 | -71. |
| 2430.00 | 525.50 | -71. |
| 2439.00 | 526.25 | -73. |
| 2448.00 | 527.00 | -73. |
| 2457.00 | 527.75 | -73. |
| 2466.00 | 528.50 | -74. |
| 2475.00 | 529.25 | -76. |
| 2484.00 | 530.00 | -76. |
| 2493.00 | 530.75 | -77. |
| 2502.00 | 531.50 | -77. |
| 2511.00 | 532.25 | -77. |
| 2520.00 | 533.00 | -77. |
| 2529.00 | 533.75 | -77. |
| 2538.00 | 534.50 | -77. |
| 2547.00 | 535.25 | -79. |
| 2556.00 | 536.00 | -77. |
| 2565.00 | 536.75 | -79. |
| 2574.00 | 537.50 | -79. |
| 2583.00 | 538.25 | -79. |
| 2592.00 | 539.00 | -79. |
| 2601.00 | 539.75 | -79. |
| 2610.00 | 540.50 | -79. |
| 2619.00 | 541.25 | -79. |
| 2628.00 | 542.00 | -79. |
| 2637.00 | 542.75 | -82. |
| 2646.00 | 543.50 | -79. |
| 2655.00 | 544.25 | -82. |
| 2664.00 | 545.00 | -83. |
| 2673.00 | 545.75 | -83. |

KINETIC ***81.11.8.21.6 GULF ATS

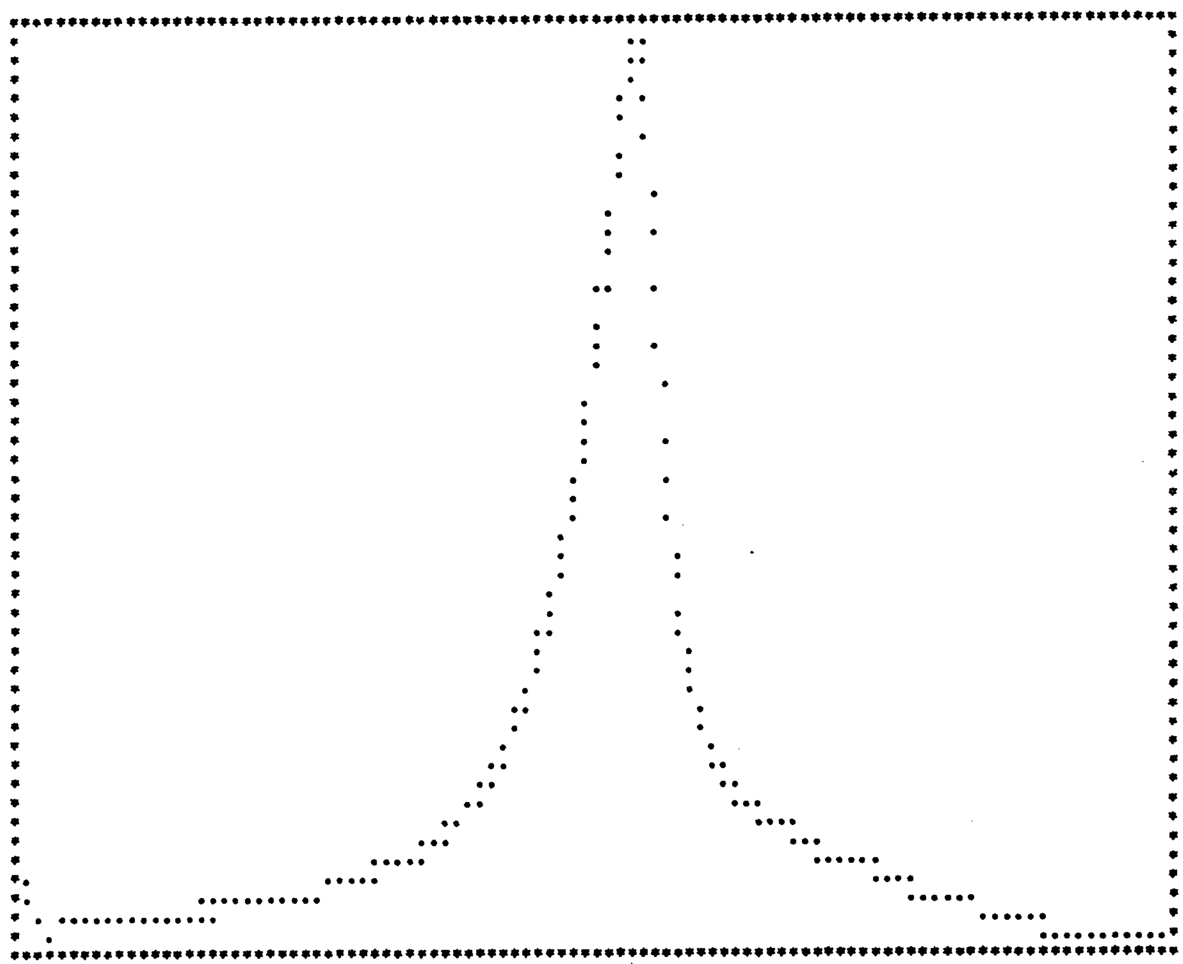
| | | |
|---|---|---|
| 2682.00 | 546.50 | -83. |
| 2691.00 | 547.25 | -83. |
| 2700.00 | 548.00 | -83. |
| 2709.00 | 548.75 | -83. |
| 2718.00 | 549.50 | -83. |
| 2727.00 | 550.25 | -83. |
| 2736.00 | 551.00 | -85. |
| 2745.00 | 551.75 | -85. |
| 2754.00 | 552.50 | -87. |
| 2763.00 | 553.25 | -86. |
| 2772.00 | 554.00 | -86. |
| 2781.00 | 554.75 | -87. |
| 2790.00 | 555.50 | -87. |
| 2799.00 | 556.25 | -87. |
| 2808.00 | 557.00 | -87. |
| 2817.00 | 557.75 | -87. |
| 2826.00 | 558.50 | -89. |
| 2835.00 | 559.25 | -87. |
| 2844.00 | 560.00 | -87. |
| 2853.00 | 560.75 | -89. |
| 2862.00 | 561.50 | -89. |
| 2871.00 | 562.25 | -89. |
| 2880.00 | 563.00 | -89. |
| 2889.00 | 563.75 | -89. |
| 2898.00 | 564.50 | -89. |
| 2907.00 | 565.25 | -89. |
| 2916.00 | 566.00 | -89. |
| 2925.00 | 566.75 | -89. |
| 2934.00 | 567.50 | -89. |
| 2943.00 | 568.25 | -89. |
| 2952.00 | 569.00 | -89. |
| 2961.00 | 569.75 | -91. |
| 2970.00 | 570.50 | -92. |
| 2979.00 | 571.25 | -92. |
| 2988.00 | 572.00 | -92. |
| 2997.00 | 572.75 | -92. |
| 3006.00 | 573.50 | -93. |
| 3015.00 | 574.25 | -93. |
| 3024.00 | 575.00 | -93. |
| 3033.00 | 575.75 | -93. |
| 3042.00 | 576.50 | -93. |
| 3051.00 | 577.25 | -93. |
| 3060.00 | 578.00 | -93. |
| 3069.00 | 578.75 | -93. |
| 3078.00 | 579.50 | -95. |
| 3087.00 | 580.25 | -93. |
| 3096.00 | 581.00 | -94. |
| 3105.00 | 581.75 | -93. |
| 3114.00 | 582.50 | -95. |
| 3123.00 | 583.25 | -95. |
| 3132.00 | 584.00 | -96. |
| 3141.00 | 584.75 | -95. |
| 3150.00 | 585.50 | -97. |
| 3159.00 | 586.25 | -97. |
| 3168.00 | 587.00 | -97. |
| 3177.00 | 587.75 | -97. |
| 3186.00 | 588.50 | -97. |

KINETIC ***81.11.8.21.6 GULF ATS

| | | |
|---|---|---|
| 3195.00 | 589.25 | -97. |
| 3204.00 | 590.00 | -97. |
| 3213.00 | 590.75 | -97. |
| 3222.00 | 591.50 | -97. |
| 3231.00 | 592.25 | -97. |
| 3240.00 | 593.00 | -97. |
| 3249.00 | 593.75 | -97. |
| 3258.00 | 594.50 | -97. |
| 3267.00 | 595.25 | -97. |
| 3276.00 | 596.00 | -97. |
| 3285.00 | 596.75 | -97. |
| 3294.00 | 597.50 | -97. |
| 3303.00 | 598.25 | -99. |
| 3312.00 | 599.00 | -97. |
| 3321.00 | 599.75 | -97. |
| 3330.00 | 600.50 | -99. |
| 3339.00 | 601.25 | -99. |
| 3348.00 | 602.00 | -97. |
| 3357.00 | 602.75 | -99. |
| 3366.00 | 603.50 | -97. |
| 3375.00 | 604.25 | -97. |
| 3384.00 | 605.00 | -97. |
| 3393.00 | 605.75 | -97. |
| 3402.00 | 606.50 | -99. |
| 3411.00 | 607.25 | -97. |
| 3420.00 | 608.00 | -97. |
| 3429.00 | 608.75 | -97. |
| 3438.00 | 609.50 | -97. |
| 3447.00 | 610.25 | -99. |
| 3456.00 | 611.00 | -99. |
| 3465.00 | 611.75 | -99. |
| 3474.00 | 612.50 | -99. |
| 3483.00 | 613.25 | -99. |
| 3492.00 | 614.00 | -99. |
| 3501.00 | 614.75 | -99. |
| 3510.00 | 615.50 | -99. |
| 3519.00 | 616.25 | -99. |
| 3528.00 | 617.00 | -99. |

KINETIC ***81.11.8.21.6 GULF ATS

GRAPH OF RAW DATA



XMIN = .32375000E+03 XMAX = .61625000E+03 YMIN = -.99000000E+02 YMAX = .15200000E+03

KINETIC ***81.11.8.21.6 GULF ATS

MAXIMUM ORDINATE= 152.0 OCCURS AT 482.00 DEG KELVIN.

PEAK SEARCH LIMITS: START PT.= 353.0 STOP PT.= 599.8 DEG. KELVIN

THE PEAK ENDS AT 256 POINTS FROM START. THE Y AT THIS POINT IS -69.15
THE BASELINE EQUATION IS Y= -.28556E+00*X+ .39566E+01

THE PEAK STARTS AT 141 POINTS FROM THE START. THE Y AT THIS POINT IS -76.94
THE BASELINE EQUATION IS Y= .18050E+00*X+ -.10239E+03

PEAK BEGINS AT 428.00 DEG KELVIN (PEAK HEIGHT = -77.12) (DATA PT. 140)
PEAK ENDS AT 515.00 DEG KELVIN (PEAK HEIGHT = -69.15) (DATA PT. 256)

NUMBER OF POINTS IN PEAK= 116

BASELINE SHIFT COMPENSATED IS -14.07

TEMPERATURES HAVE NOW BEEN CORRECTED FOR THERMAL LAG, SCAN RATE EFFECT,AND CALIBRATION ERROR.
MAGNITUDE OF THE CORRECTION AT MAXIMUM ORDINATE IS: .58

*********************************************************************************************

CALCOMP PLOT OF FAMILY OF 5 CURVES WILL BE PRODUCED.

*********************************************************************************************

| CURVE NUMBER | NUMBER OF POINTS | AREA UNDER CURVE | WEIGHT OF SAMPLE | RANGE MCAL/SEC | HEAT OF REACTION(CAL/GM) |
|---|---|---|---|---|---|
| 1 | 101 | 170.64 | 1.56 | 20.00 | 109.38 |
| 2 | 121 | 445.72 | 4.07 | 20.00 | 109.51 |
| 3 | 105 | 413.14 | 4.23 | 10.00 | 97.67 |
| 4 | 105 | 780.10 | 7.35 | 10.00 | 106.14 |
| 5 | 117 | 710.29 | 7.22 | 10.00 | 98.38 |

AVERAGE HEAT OF REACTION FOR THIS SERIES: 104.22 STANDARD DEVIATION OF: 5.20

*********************************************************************************************

********** CURVE NUMBER 1.

| TIME (SECONDS) | TEMPERATURE (KELVINS) | DC/DT (SEC-1) | C |
|---|---|---|---|
| .80 | 483.06 | .00391 | 0.000 |
| 1.60 | 484.13 | .00103 | .001 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| 2.40 | 485.22 | .00127 | .002 |
| 3.20 | 486.30 | .00150 | .003 |
| 4.00 | 487.36 | .00163 | .004 |
| 4.80 | 488.46 | .00175 | .005 |
| 5.60 | 489.54 | .00199 | .007 |
| 6.40 | 490.62 | .00211 | .009 |
| 7.20 | 491.70 | .00235 | .010 |
| 8.00 | 492.78 | .00258 | .012 |
| 8.80 | 493.87 | .00282 | .014 |
| 9.60 | 494.95 | .00305 | .017 |
| 10.40 | 496.04 | .00329 | .019 |
| 11.20 | 497.13 | .00363 | .022 |
| 12.00 | 498.21 | .00387 | .025 |
| 12.80 | 499.29 | .00410 | .028 |
| 13.60 | 500.38 | .00445 | .032 |
| 14.40 | 501.46 | .00479 | .035 |
| 15.20 | 502.57 | .00514 | .039 |
| 16.00 | 503.66 | .00548 | .044 |
| 16.80 | 504.75 | .00583 | .048 |
| 17.60 | 505.84 | .00617 | .053 |
| 18.40 | 506.94 | .00563 | .058 |
| 19.20 | 508.02 | .00686 | .063 |
| 20.00 | 509.13 | .00743 | .069 |
| 20.80 | 510.22 | .00788 | .075 |
| 21.60 | 511.32 | .00834 | .082 |
| 22.40 | 512.42 | .00879 | .089 |
| 23.20 | 513.52 | .00925 | .096 |
| 24.00 | 514.62 | .00981 | .103 |
| 24.80 | 515.74 | .01049 | .112 |
| 25.60 | 516.84 | .01105 | .120 |
| 26.40 | 517.95 | .01173 | .129 |
| 27.20 | 519.06 | .01230 | .139 |
| 28.00 | 520.17 | .01297 | .149 |
| 28.80 | 521.29 | .01376 | .160 |
| 29.60 | 522.40 | .01443 | .171 |
| 30.40 | 523.51 | .01511 | .183 |
| 31.20 | 524.63 | .01589 | .195 |
| 32.00 | 525.75 | .01668 | .208 |
| 32.80 | 526.87 | .01746 | .222 |
| 33.60 | 527.99 | .01825 | .236 |
| 34.40 | 529.11 | .01903 | .251 |
| 35.20 | 530.23 | .01993 | .267 |
| 36.00 | 531.36 | .02082 | .283 |
| 36.80 | 532.49 | .02172 | .300 |
| 37.60 | 533.61 | .02261 | .318 |
| 38.40 | 534.75 | .02362 | .336 |
| 39.20 | 535.87 | .02451 | .355 |
| 40.00 | 537.00 | .02552 | .375 |
| 40.80 | 538.13 | .02641 | .396 |
| 41.60 | 539.26 | .02741 | .418 |
| 42.40 | 540.39 | .02830 | .440 |
| 43.20 | 541.51 | .02909 | .463 |
| 44.00 | 542.63 | .02987 | .487 |
| 44.80 | 543.75 | .03065 | .511 |
| 45.60 | 544.85 | .03121 | .536 |
| 46.40 | 545.95 | .03165 | .561 |
| 47.20 | 547.04 | .03199 | .586 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| 48.00 | 548.11 | .03210 | .612 |
| 48.80 | 549.17 | .03188 | .637 |
| 49.60 | 550.22 | .03155 | .663 |
| 50.40 | 551.24 | .03089 | .688 |
| 51.20 | 552.25 | .02989 | .712 |
| 52.00 | 553.24 | .02868 | .735 |
| 52.80 | 554.22 | .02735 | .758 |
| 53.60 | 555.19 | .02569 | .779 |
| 54.40 | 556.15 | .02403 | .799 |
| 55.20 | 557.11 | .02237 | .818 |
| 56.00 | 558.07 | .02060 | .835 |
| 56.80 | 559.03 | .01894 | .851 |
| 57.60 | 559.99 | .01728 | .865 |
| 58.40 | 560.96 | .01574 | .878 |
| 59.20 | 561.94 | .01430 | .890 |
| 60.00 | 562.92 | .01298 | .901 |
| 60.80 | 563.91 | .01166 | .911 |
| 61.60 | 564.91 | .01067 | .920 |
| 62.40 | 565.91 | .00957 | .928 |
| 63.20 | 566.92 | .00869 | .935 |
| 64.00 | 567.94 | .00792 | .942 |
| 64.80 | 568.96 | .00716 | .948 |
| 65.60 | 569.99 | .00650 | .954 |
| 66.40 | 571.02 | .00596 | .958 |
| 67.20 | 572.06 | .00542 | .963 |
| 68.00 | 573.09 | .00487 | .967 |
| 68.80 | 574.14 | .00455 | .971 |
| 69.60 | 575.18 | .00412 | .974 |
| 70.40 | 576.23 | .00380 | .978 |
| 71.20 | 577.27 | .00337 | .980 |
| 72.00 | 578.32 | .00316 | .983 |
| 72.80 | 579.37 | .00284 | .985 |
| 73.60 | 580.43 | .00263 | .986 |
| 74.40 | 581.48 | .00231 | .990 |
| 75.20 | 582.54 | .00221 | .991 |
| 76.00 | 583.59 | .00189 | .993 |
| 76.80 | 584.65 | .00180 | .995 |
| 77.60 | 585.71 | .00159 | .996 |
| 78.40 | 586.77 | .00149 | .997 |
| 79.20 | 587.82 | .00128 | .998 |
| 80.00 | 588.88 | .00107 | .999 |
| 80.80 | 589.94 | .00097 | 1.000 |

*********** CURVE NUMBER 2.

| TIME (SECONDS) | TEMPERATURE (KELVINS) | DC/DT (SEC-1) | C |
|---|---|---|---|
| 1.50 | 455.37 | .00035 | 0.000 |
| 3.00 | 456.37 | .00035 | .001 |
| 4.50 | 457.38 | .00040 | .001 |
| 6.00 | 458.38 | .00045 | .002 |
| 7.50 | 459.39 | .00050 | .002 |
| 9.00 | 460.39 | .00055 | .003 |
| 10.50 | 461.40 | .00060 | .004 |
| 12.00 | 462.41 | .00064 | .005 |
| 13.50 | 463.41 | .00069 | .006 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| 15.00 | 464.42 | .00074 | .007 |
| 16.50 | 465.42 | .00079 | .008 |
| 18.00 | 466.44 | .00088 | .010 |
| 19.50 | 467.45 | .00097 | .011 |
| 21.00 | 468.45 | .00102 | .012 |
| 22.50 | 469.46 | .00107 | .014 |
| 24.00 | 470.47 | .00116 | .016 |
| 25.50 | 471.46 | .00125 | .017 |
| 27.00 | 472.49 | .00134 | .019 |
| 28.50 | 473.50 | .00143 | .021 |
| 30.00 | 474.51 | .00147 | .024 |
| 31.50 | 475.53 | .00161 | .026 |
| 33.00 | 476.54 | .00170 | .028 |
| 34.50 | 477.55 | .00179 | .031 |
| 36.00 | 478.56 | .00192 | .034 |
| 37.50 | 479.57 | .00201 | .037 |
| 39.00 | 480.59 | .00214 | .040 |
| 40.50 | 481.61 | .00227 | .043 |
| 42.00 | 482.62 | .00240 | .047 |
| 43.50 | 483.64 | .00258 | .050 |
| 45.00 | 484.66 | .00271 | .054 |
| 46.50 | 485.68 | .00288 | .059 |
| 48.00 | 486.69 | .00302 | .063 |
| 49.50 | 487.71 | .00319 | .068 |
| 51.00 | 488.73 | .00336 | .073 |
| 52.50 | 489.75 | .00354 | .078 |
| 54.00 | 490.78 | .00375 | .083 |
| 55.50 | 491.80 | .00393 | .089 |
| 57.00 | 492.83 | .00414 | .095 |
| 58.50 | 493.86 | .00440 | .101 |
| 60.00 | 494.88 | .00461 | .108 |
| 61.50 | 495.91 | .00487 | .115 |
| 63.00 | 496.94 | .00513 | .123 |
| 64.50 | 497.97 | .00534 | .131 |
| 66.00 | 499.00 | .00564 | .139 |
| 67.50 | 500.04 | .00594 | .148 |
| 69.00 | 501.07 | .00624 | .157 |
| 70.50 | 502.11 | .00554 | .166 |
| 72.00 | 503.14 | .00588 | .176 |
| 73.50 | 504.18 | .00722 | .187 |
| 75.00 | 505.22 | .00756 | .198 |
| 76.50 | 506.26 | .00790 | .210 |
| 78.00 | 507.31 | .00828 | .222 |
| 79.50 | 508.35 | .00866 | .234 |
| 81.00 | 509.40 | .00908 | .248 |
| 82.50 | 510.44 | .00946 | .262 |
| 84.00 | 511.49 | .00989 | .276 |
| 85.50 | 512.55 | .01035 | .291 |
| 87.00 | 513.60 | .01077 | .307 |
| 88.50 | 514.65 | .01124 | .324 |
| 90.00 | 515.70 | .01170 | .341 |
| 91.50 | 516.76 | .01221 | .359 |
| 93.00 | 517.81 | .01267 | .377 |
| 94.50 | 518.88 | .01321 | .397 |
| 96.00 | 519.93 | .01368 | .417 |
| 97.50 | 520.98 | .01409 | .438 |
| 99.00 | 522.05 | .01465 | .459 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| 100.50 | 523.10 | .01514 | .482 |
| 102.00 | 524.15 | .01560 | .505 |
| 103.50 | 525.20 | .01602 | .529 |
| 105.00 | 526.24 | .01635 | .553 |
| 106.50 | 527.27 | .01663 | .578 |
| 108.00 | 528.30 | .01683 | .603 |
| 109.50 | 529.31 | .01591 | .628 |
| 111.00 | 530.30 | .01685 | .653 |
| 112.50 | 531.28 | .01663 | .678 |
| 114.00 | 532.24 | .01627 | .703 |
| 115.50 | 533.17 | .01566 | .727 |
| 117.00 | 534.09 | .01497 | .750 |
| 118.50 | 534.99 | .01411 | .772 |
| 120.00 | 535.88 | .01316 | .792 |
| 121.50 | 536.77 | .01213 | .811 |
| 123.00 | 537.65 | .01109 | .829 |
| 124.50 | 538.54 | .01011 | .845 |
| 126.00 | 539.43 | .00916 | .859 |
| 127.50 | 540.32 | .00822 | .872 |
| 129.00 | 541.24 | .00745 | .884 |
| 130.50 | 542.15 | .00672 | .894 |
| 132.00 | 543.08 | .00604 | .904 |
| 133.50 | 544.01 | .00548 | .913 |
| 135.00 | 544.95 | .00493 | .920 |
| 136.50 | 545.90 | .00446 | .928 |
| 138.00 | 546.85 | .00403 | .934 |
| 139.50 | 547.81 | .00369 | .940 |
| 141.00 | 548.78 | .00335 | .945 |
| 142.50 | 549.74 | .00306 | .950 |
| 144.00 | 550.71 | .00280 | .954 |
| 145.50 | 551.69 | .00259 | .958 |
| 147.00 | 552.67 | .00238 | .962 |
| 148.50 | 553.64 | .00217 | .965 |
| 150.00 | 554.63 | .00205 | .969 |
| 151.50 | 555.61 | .00188 | .971 |
| 153.00 | 556.59 | .00172 | .974 |
| 154.50 | 557.59 | .00163 | .977 |
| 156.00 | 558.57 | .00147 | .979 |
| 157.50 | 559.56 | .00139 | .981 |
| 159.00 | 560.55 | .00126 | .983 |
| 160.50 | 561.53 | .00114 | .985 |
| 162.00 | 562.53 | .00110 | .987 |
| 163.50 | 563.52 | .00102 | .988 |
| 165.00 | 564.51 | .00094 | .990 |
| 166.50 | 565.50 | .00086 | .991 |
| 168.00 | 566.50 | .00078 | .992 |
| 169.50 | 567.49 | .00074 | .993 |
| 171.00 | 568.48 | .00066 | .994 |
| 172.50 | 569.48 | .00063 | .995 |
| 174.00 | 570.48 | .00059 | .996 |
| 175.50 | 571.47 | .00051 | .997 |
| 177.00 | 572.47 | .00052 | .998 |
| 178.50 | 573.47 | .00048 | .999 |
| 180.00 | 574.46 | .00044 | .999 |
| 181.50 | 575.45 | .00036 | 1.000 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

********** CURVE NUMBER 3.

| TIME (SECONDS) | TEMPERATURE (KELVINS) | DC/DT (SEC-1) | C |
|---|---|---|---|
| 3.00 | 450.88 | .00011 | 0.000 |
| 6.00 | 451.89 | .00015 | .000 |
| 9.00 | 452.90 | .00022 | .001 |
| 12.00 | 453.90 | .00024 | .002 |
| 15.00 | 454.90 | .00026 | .002 |
| 18.00 | 455.90 | .00030 | .003 |
| 21.00 | 456.91 | .00032 | .004 |
| 24.00 | 457.91 | .00034 | .005 |
| 27.00 | 458.91 | .00039 | .006 |
| 30.00 | 459.92 | .00041 | .007 |
| 33.00 | 460.92 | .00047 | .009 |
| 36.00 | 461.93 | .00049 | .010 |
| 39.00 | 462.93 | .00051 | .012 |
| 42.00 | 463.94 | .00058 | .013 |
| 45.00 | 464.94 | .00067 | .015 |
| 48.00 | 465.95 | .00074 | .017 |
| 51.00 | 466.96 | .00080 | .020 |
| 54.00 | 467.96 | .00087 | .022 |
| 57.00 | 468.97 | .00098 | .025 |
| 60.00 | 469.98 | .00102 | .028 |
| 63.00 | 470.98 | .00109 | .031 |
| 66.00 | 471.99 | .00118 | .034 |
| 69.00 | 473.00 | .00129 | .038 |
| 72.00 | 474.01 | .00133 | .042 |
| 75.00 | 475.02 | .00145 | .046 |
| 78.00 | 476.03 | .00156 | .051 |
| 81.00 | 477.04 | .00167 | .056 |
| 84.00 | 478.05 | .00173 | .061 |
| 87.00 | 479.06 | .00189 | .066 |
| 90.00 | 480.07 | .00196 | .072 |
| 93.00 | 481.08 | .00214 | .078 |
| 96.00 | 482.10 | .00232 | .085 |
| 99.00 | 483.11 | .00245 | .092 |
| 102.00 | 484.13 | .00261 | .099 |
| 105.00 | 485.14 | .00276 | .108 |
| 108.00 | 486.16 | .00292 | .116 |
| 111.00 | 487.18 | .00312 | .125 |
| 114.00 | 488.19 | .00328 | .135 |
| 117.00 | 489.21 | .00348 | .145 |
| 120.00 | 490.22 | .00362 | .156 |
| 123.00 | 491.24 | .00379 | .167 |
| 126.00 | 492.26 | .00402 | .178 |
| 129.00 | 493.28 | .00431 | .191 |
| 132.00 | 494.31 | .00454 | .204 |
| 135.00 | 495.32 | .00474 | .218 |
| 138.00 | 496.35 | .00499 | .233 |
| 141.00 | 497.37 | .00526 | .248 |
| 144.00 | 498.40 | .00555 | .264 |
| 147.00 | 499.42 | .00582 | .281 |
| 150.00 | 500.45 | .00609 | .299 |
| 153.00 | 501.47 | .00638 | .318 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| 156.00 | 502.50 | .00672 | .337 |
| 159.00 | 503.53 | .00699 | .358 |
| 162.00 | 504.56 | .00730 | .379 |
| 165.00 | 505.58 | .00757 | .402 |
| 168.00 | 506.61 | .00791 | .425 |
| 171.00 | 507.64 | .00822 | .449 |
| 174.00 | 508.67 | .00851 | .474 |
| 177.00 | 509.69 | .00880 | .500 |
| 180.00 | 510.72 | .00907 | .527 |
| 183.00 | 511.74 | .00934 | .555 |
| 186.00 | 512.75 | .00949 | .583 |
| 189.00 | 513.76 | .00955 | .611 |
| 192.00 | 514.77 | .00961 | .640 |
| 195.00 | 515.75 | .00942 | .669 |
| 198.00 | 516.73 | .00923 | .697 |
| 201.00 | 517.71 | .00895 | .724 |
| 204.00 | 518.68 | .00855 | .750 |
| 207.00 | 519.63 | .00797 | .775 |
| 210.00 | 520.58 | .00741 | .798 |
| 213.00 | 521.52 | .00674 | .819 |
| 216.00 | 522.46 | .00612 | .839 |
| 219.00 | 523.41 | .00547 | .856 |
| 222.00 | 524.36 | .00494 | .872 |
| 225.00 | 525.32 | .00441 | .886 |
| 228.00 | 526.27 | .00392 | .898 |
| 231.00 | 527.24 | .00348 | .909 |
| 234.00 | 528.20 | .00309 | .919 |
| 237.00 | 529.17 | .00272 | .928 |
| 240.00 | 530.14 | .00242 | .936 |
| 243.00 | 531.12 | .00214 | .942 |
| 246.00 | 532.10 | .00195 | .949 |
| 249.00 | 533.06 | .00172 | .954 |
| 252.00 | 534.08 | .00165 | .959 |
| 255.00 | 535.06 | .00140 | .964 |
| 258.00 | 536.05 | .00132 | .968 |
| 261.00 | 537.04 | .00123 | .972 |
| 264.00 | 538.04 | .00114 | .975 |
| 267.00 | 539.03 | .00102 | .978 |
| 270.00 | 540.02 | .00090 | .981 |
| 273.00 | 541.01 | .00085 | .984 |
| 276.00 | 542.01 | .00076 | .986 |
| 279.00 | 542.99 | .00062 | .988 |
| 282.00 | 543.99 | .00059 | .990 |
| 285.00 | 544.99 | .00052 | .992 |
| 288.00 | 545.98 | .00041 | .993 |
| 291.00 | 546.98 | .00040 | .994 |
| 294.00 | 547.98 | .00038 | .996 |
| 297.00 | 548.97 | .00031 | .997 |
| 300.00 | 549.97 | .00033 | .998 |
| 303.00 | 550.96 | .00019 | .998 |
| 306.00 | 551.96 | .00014 | .999 |
| 309.00 | 552.96 | .00014 | .999 |
| 312.00 | 553.96 | .00011 | 1.000 |
| 315.00 | 554.96 | .00009 | 1.000 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

********** CURVE NUMBER 4.

| TIME (SECONDS) | TEMPERATURE (KELVINS) | DC/DT (SEC-1) | C |
|---|---|---|---|
| 6.00 | 431.68 | .00001 | 0.000 |
| 12.00 | 432.69 | .00007 | .000 |
| 18.00 | 433.70 | .00010 | .001 |
| 24.00 | 434.69 | .00003 | .001 |
| 30.00 | 435.71 | .00014 | .002 |
| 36.00 | 436.71 | .00016 | .003 |
| 42.00 | 437.71 | .00015 | .003 |
| 48.00 | 438.72 | .00019 | .004 |
| 54.00 | 439.72 | .00018 | .006 |
| 60.00 | 440.72 | .00022 | .007 |
| 66.00 | 441.73 | .00025 | .008 |
| 72.00 | 442.72 | .00022 | .010 |
| 78.00 | 443.73 | .00024 | .011 |
| 84.00 | 444.74 | .00031 | .013 |
| 90.00 | 445.74 | .00034 | .014 |
| 96.00 | 446.75 | .00035 | .017 |
| 102.00 | 447.76 | .00039 | .019 |
| 108.00 | 448.76 | .00043 | .021 |
| 114.00 | 449.77 | .00045 | .024 |
| 120.00 | 450.77 | .00047 | .027 |
| 126.00 | 451.79 | .00058 | .030 |
| 132.00 | 452.79 | .00057 | .033 |
| 138.00 | 453.80 | .00063 | .037 |
| 144.00 | 454.81 | .00073 | .041 |
| 150.00 | 455.81 | .00070 | .045 |
| 156.00 | 456.82 | .00079 | .050 |
| 162.00 | 457.83 | .00079 | .054 |
| 168.00 | 458.83 | .00084 | .059 |
| 174.00 | 459.85 | .00092 | .065 |
| 180.00 | 460.86 | .00099 | .070 |
| 186.00 | 461.87 | .00104 | .076 |
| 192.00 | 462.87 | .00107 | .083 |
| 198.00 | 463.89 | .00117 | .089 |
| 204.00 | 464.90 | .00121 | .097 |
| 210.00 | 465.92 | .00133 | .104 |
| 216.00 | 466.92 | .00133 | .112 |
| 222.00 | 467.93 | .00143 | .121 |
| 228.00 | 468.94 | .00150 | .129 |
| 234.00 | 469.95 | .00157 | .139 |
| 240.00 | 470.97 | .00166 | .148 |
| 246.00 | 471.98 | .00172 | .158 |
| 252.00 | 473.00 | .00183 | .169 |
| 258.00 | 474.02 | .00195 | .180 |
| 264.00 | 475.04 | .00205 | .192 |
| 270.00 | 476.04 | .00207 | .205 |
| 276.00 | 477.08 | .00230 | .218 |
| 282.00 | 478.09 | .00236 | .232 |
| 288.00 | 479.10 | .00247 | .246 |
| 294.00 | 480.13 | .00260 | .261 |
| 300.00 | 481.15 | .00274 | .277 |
| 306.00 | 482.16 | .00281 | .294 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| 312.00 | 483.20 | .00304 | .312 |
| 318.00 | 484.22 | .00320 | .330 |
| 324.00 | 485.24 | .00332 | .350 |
| 330.00 | 486.28 | .00352 | .370 |
| 336.00 | 487.29 | .00362 | .392 |
| 342.00 | 488.31 | .00376 | .414 |
| 348.00 | 489.35 | .00400 | .437 |
| 354.00 | 490.38 | .00419 | .462 |
| 360.00 | 491.41 | .00438 | .488 |
| 366.00 | 492.44 | .00457 | .514 |
| 372.00 | 493.46 | .00469 | .542 |
| 378.00 | 494.49 | .00484 | .571 |
| 384.00 | 495.51 | .00494 | .600 |
| 390.00 | 496.51 | .00495 | .630 |
| 396.00 | 497.51 | .00495 | .660 |
| 402.00 | 498.50 | .00493 | .689 |
| 408.00 | 499.48 | .00476 | .718 |
| 414.00 | 500.45 | .00454 | .746 |
| 420.00 | 501.40 | .00423 | .772 |
| 426.00 | 502.35 | .00395 | .797 |
| 432.00 | 503.30 | .00360 | .820 |
| 438.00 | 504.24 | .00320 | .840 |
| 444.00 | 505.19 | .00290 | .858 |
| 450.00 | 506.14 | .00255 | .875 |
| 456.00 | 507.09 | .00222 | .889 |
| 462.00 | 508.05 | .00196 | .902 |
| 468.00 | 509.01 | .00171 | .913 |
| 474.00 | 509.99 | .00158 | .922 |
| 480.00 | 510.96 | .00138 | .931 |
| 486.00 | 511.93 | .00122 | .939 |
| 492.00 | 512.92 | .00116 | .946 |
| 498.00 | 513.90 | .00096 | .953 |
| 504.00 | 514.88 | .00089 | .958 |
| 510.00 | 515.86 | .00076 | .963 |
| 516.00 | 516.85 | .00068 | .967 |
| 522.00 | 517.85 | .00063 | .971 |
| 528.00 | 518.84 | .00056 | .975 |
| 534.00 | 519.83 | .00049 | .978 |
| 540.00 | 520.82 | .00047 | .981 |
| 546.00 | 521.81 | .00041 | .983 |
| 552.00 | 522.81 | .00037 | .986 |
| 558.00 | 523.82 | .00043 | .988 |
| 564.00 | 524.80 | .00028 | .990 |
| 570.00 | 525.80 | .00031 | .992 |
| 576.00 | 526.79 | .00022 | .994 |
| 582.00 | 527.79 | .00021 | .995 |
| 588.00 | 528.77 | .00006 | .996 |
| 594.00 | 529.79 | .00023 | .997 |
| 600.00 | 530.77 | .00010 | .998 |
| 606.00 | 531.76 | .00014 | .998 |
| 612.00 | 532.77 | .00008 | .999 |
| 618.00 | 533.77 | .00007 | .999 |
| 624.00 | 534.77 | .00005 | 1.000 |
| 630.00 | 535.77 | .00003 | 1.000 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

********** CURVE NUMBER 5.

| TIME (SECONDS) | TEMPERATURE (KELVINS) | DC/DT (SEC-1) | C |
|---|---|---|---|
| 9.00 | 428.11 | .00006 | 0.000 |
| 18.00 | 428.86 | .00006 | .001 |
| 27.00 | 429.61 | .00006 | .001 |
| 36.00 | 430.36 | .00008 | .002 |
| 45.00 | 431.11 | .00008 | .002 |
| 54.00 | 431.87 | .00011 | .003 |
| 63.00 | 432.62 | .00011 | .004 |
| 72.00 | 433.37 | .00011 | .005 |
| 81.00 | 434.12 | .00014 | .006 |
| 90.00 | 434.88 | .00014 | .008 |
| 99.00 | 435.63 | .00015 | .009 |
| 108.00 | 436.38 | .00016 | .010 |
| 117.00 | 437.14 | .00020 | .012 |
| 126.00 | 437.89 | .00020 | .014 |
| 135.00 | 438.64 | .00020 | .016 |
| 144.00 | 439.39 | .00022 | .017 |
| 153.00 | 440.15 | .00025 | .020 |
| 162.00 | 440.90 | .00025 | .022 |
| 171.00 | 441.65 | .00028 | .024 |
| 180.00 | 442.40 | .00028 | .027 |
| 189.00 | 443.16 | .00031 | .029 |
| 198.00 | 443.91 | .00031 | .032 |
| 207.00 | 444.66 | .00033 | .035 |
| 216.00 | 445.42 | .00035 | .038 |
| 225.00 | 446.17 | .00039 | .041 |
| 234.00 | 446.93 | .00041 | .045 |
| 243.00 | 447.68 | .00041 | .049 |
| 252.00 | 448.43 | .00044 | .053 |
| 261.00 | 449.19 | .00048 | .057 |
| 270.00 | 449.94 | .00052 | .061 |
| 279.00 | 450.70 | .00052 | .066 |
| 288.00 | 451.45 | .00058 | .071 |
| 297.00 | 452.21 | .00060 | .076 |
| 306.00 | 452.96 | .00060 | .082 |
| 315.00 | 453.72 | .00066 | .087 |
| 324.00 | 454.47 | .00068 | .093 |
| 333.00 | 455.23 | .00071 | .100 |
| 342.00 | 455.98 | .00075 | .106 |
| 351.00 | 456.74 | .00079 | .113 |
| 360.00 | 457.50 | .00083 | .120 |
| 369.00 | 458.25 | .00087 | .128 |
| 378.00 | 459.01 | .00092 | .136 |
| 387.00 | 459.77 | .00095 | .144 |
| 396.00 | 460.52 | .00100 | .153 |
| 405.00 | 461.28 | .00104 | .162 |
| 414.00 | 462.04 | .00109 | .172 |
| 423.00 | 462.80 | .00114 | .182 |
| 432.00 | 463.56 | .00120 | .192 |
| 441.00 | 464.31 | .00125 | .203 |
| 450.00 | 465.07 | .00130 | .215 |
| 459.00 | 465.83 | .00135 | .227 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| 466.00 | 466.59 | .00143 | .239 |
| 477.00 | 467.35 | .00148 | .253 |
| 486.00 | 468.11 | .00156 | .266 |
| 495.00 | 468.87 | .00160 | .281 |
| 504.00 | 469.63 | .00169 | .295 |
| 513.00 | 470.35 | .00148 | .310 |
| 522.00 | 471.15 | .00182 | .324 |
| 531.00 | 471.91 | .00190 | .341 |
| 540.00 | 472.68 | .00199 | .359 |
| 549.00 | 473.44 | .00208 | .377 |
| 558.00 | 474.20 | .00215 | .396 |
| 567.00 | 474.97 | .00224 | .416 |
| 576.00 | 475.73 | .00234 | .437 |
| 585.00 | 476.49 | .00242 | .458 |
| 594.00 | 477.26 | .00253 | .480 |
| 603.00 | 478.02 | .00262 | .503 |
| 612.00 | 478.79 | .00271 | .527 |
| 621.00 | 479.55 | .00281 | .552 |
| 630.00 | 480.31 | .00289 | .578 |
| 639.00 | 481.07 | .00295 | .604 |
| 648.00 | 481.83 | .00300 | .631 |
| 657.00 | 482.56 | .00301 | .658 |
| 666.00 | 483.33 | .00298 | .685 |
| 675.00 | 484.07 | .00289 | .711 |
| 684.00 | 484.80 | .00278 | .737 |
| 693.00 | 485.53 | .00261 | .761 |
| 702.00 | 486.25 | .00242 | .784 |
| 711.00 | 486.98 | .00223 | .805 |
| 720.00 | 487.70 | .00204 | .824 |
| 729.00 | 488.42 | .00185 | .841 |
| 738.00 | 489.15 | .00166 | .857 |
| 747.00 | 489.87 | .00147 | .871 |
| 756.00 | 490.60 | .00133 | .884 |
| 765.00 | 491.33 | .00120 | .895 |
| 774.00 | 492.06 | .00106 | .905 |
| 783.00 | 492.80 | .00095 | .914 |
| 792.00 | 493.53 | .00084 | .922 |
| 801.00 | 494.27 | .00076 | .930 |
| 810.00 | 495.01 | .00069 | .936 |
| 819.00 | 495.76 | .00063 | .942 |
| 828.00 | 496.50 | .00056 | .948 |
| 837.00 | 497.24 | .00053 | .952 |
| 846.00 | 497.99 | .00048 | .957 |
| 855.00 | 498.73 | .00042 | .961 |
| 864.00 | 499.48 | .00040 | .965 |
| 873.00 | 500.23 | .00040 | .968 |
| 882.00 | 500.97 | .00034 | .972 |
| 891.00 | 501.72 | .00032 | .975 |
| 900.00 | 502.46 | .00029 | .977 |
| 909.00 | 503.21 | .00026 | .980 |
| 918.00 | 503.96 | .00026 | .982 |
| 927.00 | 504.70 | .00021 | .984 |
| 936.00 | 505.46 | .00021 | .986 |
| 945.00 | 506.20 | .00018 | .988 |
| 954.00 | 506.95 | .00016 | .990 |
| 963.00 | 507.70 | .00016 | .991 |
| 972.00 | 508.45 | .00016 | .992 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| 981.00 | 509.20 | .00013 | .994 |
| 990.00 | 509.95 | .00013 | .995 |
| 999.00 | 510.69 | .00008 | .996 |
| 1008.00 | 511.44 | .00009 | .997 |
| 1017.00 | 512.19 | .00008 | .997 |
| 1026.00 | 512.94 | .00008 | .998 |
| 1035.00 | 513.70 | .00006 | .999 |
| 1044.00 | 514.44 | .00006 | 1.000 |
| 1053.00 | 515.19 | .00006 | 1.000 |

*****************************************************************************************************

TABULATED PREKINETIC DATA (INTERPOLATED) FOR EACH CURVE ON THIS GRAPH (NO. 1 )

CURVE NO. 1 HEAT RATE= 80.000

| C (FRACTION) | TIME (SEC) | TEMP (KELVINS) | DC/DT (SEC-1) |
|---|---|---|---|
| .01 | 7.06 | 491.51 | .00230 |
| .02 | 10.60 | 496.31 | .00336 |
| .03 | 13.21 | 499.85 | .00427 |
| .04 | 15.32 | 502.73 | .00519 |
| .05 | 17.12 | 505.18 | .00596 |
| .06 | 18.69 | 507.33 | .00672 |
| .07 | 20.11 | 509.28 | .00749 |
| .08 | 21.39 | 511.03 | .00822 |
| .09 | 22.56 | 512.63 | .00888 |
| .10 | 23.64 | 514.13 | .00954 |
| .11 | 24.65 | 515.52 | .01037 |
| .12 | 25.58 | 516.81 | .01104 |
| .13 | 26.46 | 518.03 | .01177 |
| .14 | 27.29 | 519.18 | .01236 |
| .15 | 28.07 | 520.27 | .01304 |
| .16 | 28.82 | 521.32 | .01377 |
| .17 | 29.53 | 522.30 | .01437 |
| .18 | 30.21 | 523.25 | .01494 |
| .19 | 30.87 | 524.17 | .01556 |
| .20 | 31.50 | 525.05 | .01619 |
| .21 | 32.10 | 525.90 | .01678 |
| .22 | 32.69 | 526.72 | .01736 |
| .23 | 33.26 | 527.51 | .01791 |
| .24 | 33.81 | 528.28 | .01845 |
| .25 | 34.34 | 529.03 | .01897 |
| .26 | 34.86 | 529.76 | .01954 |
| .27 | 35.37 | 530.47 | .02011 |
| .28 | 35.86 | 531.16 | .02066 |
| .29 | 36.33 | 531.83 | .02120 |
| .30 | 36.80 | 532.49 | .02172 |
| .31 | 37.25 | 533.13 | .02223 |
| .32 | 37.70 | 533.75 | .02273 |
| .33 | 38.13 | 534.37 | .02328 |
| .34 | 38.56 | 534.97 | .02380 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| .35 | 38.98 | 535.55 | .02426 |
| .36 | 39.38 | 536.13 | .02474 |
| .37 | 39.78 | 536.70 | .02525 |
| .38 | 40.18 | 537.25 | .02572 |
| .39 | 40.56 | 537.80 | .02614 |
| .40 | 40.94 | 538.33 | .02658 |
| .41 | 41.31 | 538.86 | .02706 |
| .42 | 41.68 | 539.38 | .02751 |
| .43 | 42.04 | 539.89 | .02793 |
| .44 | 42.40 | 540.39 | .02830 |
| .45 | 42.75 | 540.88 | .02864 |
| .46 | 43.10 | 541.36 | .02898 |
| .47 | 43.44 | 541.84 | .02932 |
| .48 | 43.78 | 542.32 | .02965 |
| .49 | 44.11 | 542.79 | .02998 |
| .50 | 44.44 | 543.25 | .03030 |
| .51 | 44.77 | 543.71 | .03062 |
| .52 | 45.10 | 544.15 | .03089 |
| .53 | 45.42 | 544.61 | .03110 |
| .54 | 45.74 | 545.05 | .03129 |
| .55 | 46.06 | 545.48 | .03147 |
| .56 | 46.38 | 545.92 | .03164 |
| .57 | 46.69 | 546.35 | .03179 |
| .58 | 47.01 | 546.78 | .03192 |
| .59 | 47.32 | 547.20 | .03203 |
| .60 | 47.63 | 547.62 | .03210 |
| .61 | 47.94 | 548.04 | .03211 |
| .62 | 48.26 | 548.45 | .03205 |
| .63 | 48.57 | 548.87 | .03196 |
| .64 | 48.88 | 549.28 | .03185 |
| .65 | 49.20 | 549.69 | .03174 |
| .66 | 49.51 | 550.10 | .03160 |
| .67 | 49.83 | 550.52 | .03141 |
| .68 | 50.15 | 550.93 | .03114 |
| .69 | 50.47 | 551.34 | .03081 |
| .70 | 50.80 | 551.75 | .03043 |
| .71 | 51.13 | 552.16 | .02999 |
| .72 | 51.47 | 552.58 | .02950 |
| .73 | 51.81 | 553.00 | .02897 |
| .74 | 52.16 | 553.43 | .02843 |
| .75 | 52.51 | 553.87 | .02788 |
| .76 | 52.88 | 554.32 | .02719 |
| .77 | 53.25 | 554.77 | .02641 |
| .78 | 53.63 | 555.23 | .02562 |
| .79 | 54.03 | 555.70 | .02479 |
| .80 | 54.44 | 556.20 | .02394 |
| .81 | 54.87 | 556.71 | .02306 |
| .82 | 55.31 | 557.24 | .02214 |
| .83 | 55.77 | 557.79 | .02109 |
| .84 | 56.26 | 558.38 | .02006 |
| .85 | 56.77 | 558.99 | .01900 |
| .86 | 57.31 | 559.65 | .01788 |
| .87 | 57.89 | 560.34 | .01670 |
| .88 | 58.51 | 561.10 | .01553 |
| .89 | 59.18 | 561.91 | .01433 |
| .90 | 59.91 | 562.81 | .01313 |
| .91 | 60.71 | 563.80 | .01180 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| .92 | 61.60 | 564.91 | .01066 |
| .93 | 62.60 | 566.17 | .00932 |
| .94 | 63.75 | 567.62 | .00816 |
| .95 | 65.08 | 569.32 | .00691 |
| .96 | 66.65 | 571.35 | .00579 |
| .97 | 68.60 | 573.87 | .00464 |
| .98 | 71.07 | 577.10 | .00343 |
| .99 | 74.56 | 581.69 | .00228 |

CURVE NO. 2 HEAT RATE= 40.000

| C (FRACTION) | TIME (SEC) | TEMP (KELVINS) | DC/DT (SEC-1) |
|---|---|---|---|
| .01 | 18.55 | 466.81 | .00092 |
| .02 | 27.47 | 472.81 | .00137 |
| .03 | 33.93 | 477.16 | .00175 |
| .04 | 39.07 | 480.64 | .00215 |
| .05 | 43.34 | 483.53 | .00256 |
| .06 | 46.99 | 486.01 | .00293 |
| .07 | 50.23 | 488.21 | .00327 |
| .08 | 53.13 | 490.19 | .00362 |
| .09 | 55.76 | 491.98 | .00396 |
| .10 | 58.17 | 493.63 | .00434 |
| .11 | 60.39 | 495.15 | .00468 |
| .12 | 62.45 | 496.56 | .00503 |
| .13 | 64.38 | 497.88 | .00532 |
| .14 | 66.20 | 499.14 | .00568 |
| .15 | 67.91 | 500.32 | .00602 |
| .16 | 69.52 | 501.43 | .00634 |
| .17 | 71.06 | 502.50 | .00666 |
| .18 | 72.53 | 503.51 | .00700 |
| .19 | 73.92 | 504.48 | .00731 |
| .20 | 75.26 | 505.41 | .00762 |
| .21 | 76.55 | 506.30 | .00791 |
| .22 | 77.79 | 507.15 | .00822 |
| .23 | 78.99 | 507.99 | .00853 |
| .24 | 80.14 | 508.80 | .00884 |
| .25 | 81.25 | 509.57 | .00915 |
| .26 | 82.33 | 510.32 | .00942 |
| .27 | 83.37 | 511.05 | .00970 |
| .28 | 84.39 | 511.76 | .01000 |
| .29 | 85.37 | 512.46 | .01031 |
| .30 | 86.33 | 513.13 | .01058 |
| .31 | 87.26 | 513.78 | .01085 |
| .32 | 88.17 | 514.42 | .01113 |
| .33 | 89.06 | 515.04 | .01141 |
| .34 | 89.92 | 515.65 | .01168 |
| .35 | 90.77 | 516.25 | .01196 |
| .36 | 91.60 | 516.83 | .01224 |
| .37 | 92.41 | 517.40 | .01248 |
| .38 | 93.20 | 517.95 | .01274 |
| .39 | 93.98 | 518.51 | .01303 |
| .40 | 94.74 | 519.04 | .01329 |
| .41 | 95.48 | 519.57 | .01352 |
| .42 | 96.22 | 520.08 | .01374 |
| .43 | 96.94 | 520.59 | .01393 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| .44 | 97.65 | 521.09 | .01414 |
| .45 | 98.35 | 521.58 | .01443 |
| .46 | 99.04 | 522.07 | .01469 |
| .47 | 99.71 | 522.55 | .01490 |
| .48 | 100.38 | 523.02 | .01510 |
| .49 | 101.04 | 523.48 | .01531 |
| .50 | 101.69 | 523.93 | .01550 |
| .51 | 102.33 | 524.38 | .01570 |
| .52 | 102.96 | 524.83 | .01588 |
| .53 | 103.59 | 525.26 | .01604 |
| .54 | 104.21 | 525.69 | .01618 |
| .55 | 104.82 | 526.12 | .01631 |
| .56 | 105.44 | 526.54 | .01643 |
| .57 | 106.04 | 526.96 | .01655 |
| .58 | 106.64 | 527.37 | .01666 |
| .59 | 107.24 | 527.78 | .01675 |
| .60 | 107.84 | 528.19 | .01682 |
| .61 | 108.43 | 528.59 | .01687 |
| .62 | 109.03 | 528.99 | .01690 |
| .63 | 109.62 | 529.38 | .01691 |
| .64 | 110.21 | 529.78 | .01690 |
| .65 | 110.80 | 530.17 | .01687 |
| .66 | 111.40 | 530.55 | .01681 |
| .67 | 111.99 | 530.95 | .01672 |
| .68 | 112.59 | 531.34 | .01661 |
| .69 | 113.20 | 531.73 | .01649 |
| .70 | 113.81 | 532.12 | .01633 |
| .71 | 114.43 | 532.50 | .01612 |
| .72 | 115.05 | 532.89 | .01586 |
| .73 | 115.69 | 533.28 | .01558 |
| .74 | 116.34 | 533.68 | .01529 |
| .75 | 117.00 | 534.09 | .01497 |
| .76 | 117.67 | 534.50 | .01460 |
| .77 | 118.37 | 534.91 | .01419 |
| .78 | 119.09 | 535.34 | .01375 |
| .79 | 119.83 | 535.78 | .01328 |
| .80 | 120.59 | 536.23 | .01275 |
| .81 | 121.40 | 536.71 | .01220 |
| .82 | 122.24 | 537.20 | .01162 |
| .83 | 123.12 | 537.72 | .01101 |
| .84 | 124.05 | 538.27 | .01039 |
| .85 | 125.05 | 538.86 | .00976 |
| .86 | 126.11 | 539.49 | .00910 |
| .87 | 127.25 | 540.18 | .00838 |
| .88 | 128.50 | 540.93 | .00769 |
| .89 | 129.85 | 541.76 | .00703 |
| .90 | 131.35 | 542.68 | .00631 |
| .91 | 133.02 | 543.72 | .00566 |
| .92 | 134.91 | 544.89 | .00496 |
| .93 | 137.07 | 546.26 | .00429 |
| .94 | 139.59 | 547.87 | .00367 |
| .95 | 142.58 | 549.79 | .00304 |
| .96 | 146.21 | 552.15 | .00250 |
| .97 | 150.74 | 555.11 | .00197 |
| .98 | 156.68 | 559.02 | .00143 |
| .99 | 165.32 | 564.73 | .00093 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

CURVE NO. 3 HEAT RATE= 20.000

| C (FRACTION) | TIME (SEC) | TEMP (KELVINS) | DC/DT (SEC-1) |
|---|---|---|---|
| .01 | 35.69 | 461.82 | .00049 |
| .02 | 51.50 | 467.12 | .00081 |
| .03 | 62.02 | 470.56 | .00107 |
| .04 | 70.42 | 473.48 | .00131 |
| .05 | 77.51 | 475.86 | .00154 |
| .06 | 83.59 | 477.91 | .00172 |
| .07 | 89.02 | 479.74 | .00192 |
| .08 | 93.90 | 481.39 | .00219 |
| .09 | 98.22 | 482.85 | .00242 |
| .10 | 102.20 | 484.19 | .00262 |
| .11 | 105.88 | 485.44 | .00281 |
| .12 | 109.32 | 486.61 | .00301 |
| .13 | 112.54 | 487.70 | .00320 |
| .14 | 115.57 | 488.72 | .00339 |
| .15 | 118.45 | 489.70 | .00355 |
| .16 | 121.22 | 490.63 | .00368 |
| .17 | 123.88 | 491.53 | .00385 |
| .18 | 126.40 | 492.39 | .00406 |
| .19 | 128.80 | 493.22 | .00430 |
| .20 | 131.08 | 493.99 | .00447 |
| .21 | 133.28 | 494.74 | .00462 |
| .22 | 135.41 | 495.45 | .00477 |
| .23 | 137.47 | 496.16 | .00494 |
| .24 | 139.45 | 496.84 | .00511 |
| .25 | 141.38 | 497.50 | .00529 |
| .26 | 143.23 | 498.14 | .00547 |
| .27 | 145.03 | 498.75 | .00564 |
| .28 | 146.78 | 499.35 | .00580 |
| .29 | 148.48 | 499.93 | .00595 |
| .30 | 150.14 | 500.49 | .00610 |
| .31 | 151.76 | 501.05 | .00626 |
| .32 | 153.34 | 501.59 | .00641 |
| .33 | 154.88 | 502.12 | .00659 |
| .34 | 156.38 | 502.63 | .00675 |
| .35 | 157.84 | 503.13 | .00688 |
| .36 | 159.28 | 503.62 | .00701 |
| .37 | 160.69 | 504.11 | .00716 |
| .38 | 162.07 | 504.58 | .00731 |
| .39 | 163.43 | 505.04 | .00742 |
| .40 | 164.77 | 505.50 | .00754 |
| .41 | 166.08 | 505.95 | .00769 |
| .42 | 167.37 | 506.39 | .00783 |
| .43 | 168.63 | 506.83 | .00798 |
| .44 | 169.88 | 507.25 | .00810 |
| .45 | 171.10 | 507.67 | .00823 |
| .46 | 172.31 | 508.09 | .00835 |
| .47 | 173.50 | 508.49 | .00846 |
| .48 | 174.67 | 508.89 | .00858 |
| .49 | 175.83 | 509.29 | .00869 |
| .50 | 176.97 | 509.68 | .00880 |
| .51 | 178.10 | 510.07 | .00890 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| .52 | 179.22 | 510.45 | .00900 |
| .53 | 180.33 | 510.83 | .00910 |
| .54 | 181.42 | 511.20 | .00920 |
| .55 | 182.50 | 511.57 | .00929 |
| .56 | 183.57 | 511.94 | .00938 |
| .57 | 184.64 | 512.30 | .00945 |
| .58 | 185.70 | 512.65 | .00948 |
| .59 | 186.75 | 513.01 | .00950 |
| .60 | 187.80 | 513.36 | .00953 |
| .61 | 188.85 | 513.71 | .00955 |
| .62 | 189.89 | 514.05 | .00958 |
| .63 | 190.94 | 514.41 | .00961 |
| .64 | 191.98 | 514.75 | .00961 |
| .65 | 193.03 | 515.11 | .00956 |
| .66 | 194.08 | 515.45 | .00949 |
| .67 | 195.13 | 515.79 | .00941 |
| .68 | 196.20 | 516.14 | .00934 |
| .69 | 197.28 | 516.50 | .00928 |
| .70 | 198.36 | 516.85 | .00920 |
| .71 | 199.45 | 517.21 | .00911 |
| .72 | 200.56 | 517.57 | .00899 |
| .73 | 201.68 | 517.93 | .00888 |
| .74 | 202.82 | 518.30 | .00874 |
| .75 | 203.97 | 518.67 | .00856 |
| .76 | 205.16 | 519.04 | .00833 |
| .77 | 206.38 | 519.43 | .00809 |
| .78 | 207.63 | 519.83 | .00785 |
| .79 | 208.92 | 520.24 | .00761 |
| .80 | 210.26 | 520.66 | .00736 |
| .81 | 211.65 | 521.10 | .00705 |
| .82 | 213.10 | 521.55 | .00672 |
| .83 | 214.62 | 522.03 | .00641 |
| .84 | 216.23 | 522.54 | .00607 |
| .85 | 217.93 | 523.07 | .00570 |
| .86 | 219.74 | 523.64 | .00533 |
| .87 | 221.67 | 524.26 | .00500 |
| .88 | 223.75 | 524.92 | .00463 |
| .89 | 226.00 | 525.64 | .00424 |
| .90 | 228.47 | 526.43 | .00385 |
| .91 | 231.21 | 527.30 | .00346 |
| .92 | 234.28 | 528.29 | .00305 |
| .93 | 237.80 | 529.43 | .00264 |
| .94 | 241.91 | 530.77 | .00224 |
| .95 | 246.77 | 532.35 | .00190 |
| .96 | 252.55 | 534.25 | .00161 |
| .97 | 259.73 | 536.62 | .00127 |
| .98 | 268.65 | 539.57 | .00095 |
| .99 | 281.67 | 543.88 | .00060 |

CURVE NO. 4 HEAT RATE= 10.000

| C (FRACTION) | TIME (SEC) | TEMP (KELVINS) | DC/DT (SEC-1) |
|---|---|---|---|
| .01 | 74.05 | 443.07 | .00022 |
| .02 | 105.02 | 448.25 | .00041 |
| .03 | 126.33 | 451.84 | .00058 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| .04 | 142.09 | 454.59 | .00071 |
| .05 | 150.43 | 456.90 | .00079 |
| .06 | 168.85 | 458.95 | .00085 |
| .07 | 179.72 | 460.81 | .00099 |
| .08 | 189.45 | 462.45 | .00106 |
| .09 | 198.48 | 463.97 | .00118 |
| .10 | 206.73 | 465.35 | .00126 |
| .11 | 214.36 | 466.54 | .00132 |
| .12 | 221.64 | 467.87 | .00143 |
| .13 | 228.46 | 469.02 | .00150 |
| .14 | 234.94 | 470.12 | .00158 |
| .15 | 241.09 | 471.15 | .00167 |
| .16 | 246.96 | 472.14 | .00173 |
| .17 | 252.55 | 473.09 | .00184 |
| .18 | 257.82 | 473.99 | .00195 |
| .19 | 262.83 | 474.84 | .00203 |
| .20 | 267.73 | 475.65 | .00206 |
| .21 | 272.48 | 476.47 | .00216 |
| .22 | 276.96 | 477.24 | .00231 |
| .23 | 281.25 | 477.95 | .00235 |
| .24 | 285.43 | 478.67 | .00242 |
| .25 | 289.51 | 479.35 | .00250 |
| .26 | 293.43 | 480.03 | .00259 |
| .27 | 297.22 | 480.65 | .00267 |
| .28 | 300.92 | 481.30 | .00275 |
| .29 | 304.53 | 481.91 | .00278 |
| .30 | 308.05 | 482.51 | .00288 |
| .31 | 311.45 | 483.10 | .00302 |
| .32 | 314.71 | 483.55 | .00311 |
| .33 | 317.88 | 484.20 | .00319 |
| .34 | 320.98 | 484.73 | .00326 |
| .35 | 324.02 | 485.25 | .00332 |
| .36 | 326.98 | 485.76 | .00342 |
| .37 | 329.87 | 486.25 | .00352 |
| .38 | 332.70 | 486.73 | .00357 |
| .39 | 335.48 | 487.20 | .00361 |
| .40 | 338.22 | 487.67 | .00367 |
| .41 | 340.92 | 488.13 | .00374 |
| .42 | 343.57 | 488.59 | .00382 |
| .43 | 346.15 | 489.03 | .00393 |
| .44 | 348.65 | 489.47 | .00402 |
| .45 | 351.13 | 489.89 | .00410 |
| .46 | 353.54 | 490.30 | .00417 |
| .47 | 355.92 | 490.71 | .00424 |
| .48 | 358.26 | 491.11 | .00432 |
| .49 | 360.55 | 491.51 | .00439 |
| .50 | 362.80 | 491.89 | .00447 |
| .51 | 365.03 | 492.23 | .00454 |
| .52 | 367.22 | 492.65 | .00460 |
| .53 | 369.39 | 493.02 | .00464 |
| .54 | 371.53 | 493.35 | .00468 |
| .55 | 373.66 | 493.75 | .00472 |
| .56 | 375.76 | 494.11 | .00478 |
| .57 | 377.84 | 494.46 | .00484 |
| .58 | 379.90 | 494.81 | .00488 |
| .59 | 381.94 | 495.15 | .00492 |
| .60 | 383.97 | 495.50 | .00494 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| .61 | 385.99 | 495.84 | .00495 |
| .62 | 388.02 | 496.18 | .00495 |
| .63 | 390.04 | 496.51 | .00495 |
| .64 | 392.06 | 496.85 | .00495 |
| .65 | 394.08 | 497.19 | .00495 |
| .66 | 396.10 | 497.52 | .00495 |
| .67 | 398.12 | 497.86 | .00494 |
| .68 | 400.15 | 498.20 | .00493 |
| .69 | 402.18 | 498.53 | .00493 |
| .70 | 404.22 | 498.87 | .00489 |
| .71 | 406.29 | 499.20 | .00482 |
| .72 | 408.38 | 499.54 | .00475 |
| .73 | 410.50 | 499.88 | .00468 |
| .74 | 412.66 | 500.23 | .00460 |
| .75 | 414.86 | 500.58 | .00449 |
| .76 | 417.12 | 500.94 | .00437 |
| .77 | 419.44 | 501.31 | .00425 |
| .78 | 421.82 | 501.69 | .00414 |
| .79 | 424.27 | 502.08 | .00403 |
| .80 | 426.78 | 502.48 | .00391 |
| .81 | 429.40 | 502.89 | .00377 |
| .82 | 432.12 | 503.32 | .00360 |
| .83 | 434.98 | 503.77 | .00339 |
| .84 | 438.01 | 504.24 | .00320 |
| .85 | 441.21 | 504.75 | .00304 |
| .86 | 444.60 | 505.29 | .00287 |
| .87 | 448.24 | 505.85 | .00266 |
| .88 | 452.15 | 506.48 | .00243 |
| .89 | 456.47 | 507.16 | .00220 |
| .90 | 461.24 | 507.93 | .00200 |
| .91 | 466.57 | 508.78 | .00177 |
| .92 | 472.50 | 509.74 | .00162 |
| .93 | 479.09 | 510.81 | .00141 |
| .94 | 486.76 | 512.05 | .00120 |
| .95 | 495.50 | 513.49 | .00104 |
| .96 | 506.17 | 515.24 | .00084 |
| .97 | 519.95 | 517.51 | .00064 |
| .98 | 538.12 | 520.51 | .00047 |
| .99 | 562.87 | 524.61 | .00030 |

CURVE NO. 5 HEAT RATE= 5.000

| C (FRACTION) | TIME (SEC) | TEMP (KELVINS) | DC/DT (SEC-1) |
|---|---|---|---|
| .01 | 105.17 | 436.14 | .00016 |
| .02 | 154.59 | 440.28 | .00025 |
| .03 | 190.97 | 443.32 | .00031 |
| .04 | 221.27 | 445.85 | .00037 |
| .05 | 245.94 | 447.92 | .00042 |
| .06 | 267.49 | 449.73 | .00051 |
| .07 | 286.38 | 451.32 | .00056 |
| .08 | 303.30 | 452.73 | .00060 |
| .09 | 319.10 | 454.06 | .00067 |
| .10 | 333.60 | 455.28 | .00071 |
| .11 | 347.10 | 456.41 | .00077 |
| .12 | 359.63 | 457.46 | .00083 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| .13 | 371.35 | 458.45 | .00088 |
| .14 | 382.35 | 459.33 | .00094 |
| .15 | 392.82 | 460.26 | .00098 |
| .16 | 402.77 | 461.09 | .00103 |
| .17 | 412.26 | 461.69 | .00106 |
| .18 | 421.29 | 462.65 | .00113 |
| .19 | 429.92 | 463.38 | .00118 |
| .20 | 438.19 | 464.08 | .00123 |
| .21 | 446.15 | 464.75 | .00128 |
| .22 | 453.85 | 465.40 | .00132 |
| .23 | 461.27 | 466.02 | .00137 |
| .24 | 468.39 | 466.53 | .00144 |
| .25 | 475.27 | 467.20 | .00148 |
| .26 | 481.92 | 467.77 | .00152 |
| .27 | 488.38 | 468.31 | .00156 |
| .28 | 494.68 | 468.54 | .00160 |
| .29 | 500.74 | 469.35 | .00166 |
| .30 | 506.91 | 469.87 | .00165 |
| .31 | 513.24 | 470.37 | .00148 |
| .32 | 519.39 | 470.92 | .00175 |
| .33 | 525.08 | 471.41 | .00185 |
| .34 | 530.36 | 471.86 | .00190 |
| .35 | 535.54 | 472.30 | .00195 |
| .36 | 540.62 | 472.73 | .00200 |
| .37 | 545.56 | 473.15 | .00205 |
| .38 | 550.38 | 473.55 | .00210 |
| .39 | 555.12 | 473.95 | .00213 |
| .40 | 559.77 | 474.35 | .00216 |
| .41 | 564.34 | 474.74 | .00221 |
| .42 | 568.81 | 475.12 | .00226 |
| .43 | 573.19 | 475.49 | .00231 |
| .44 | 577.47 | 475.85 | .00236 |
| .45 | 581.68 | 476.21 | .00240 |
| .46 | 585.82 | 476.56 | .00243 |
| .47 | 589.90 | 476.91 | .00248 |
| .48 | 593.90 | 477.25 | .00252 |
| .49 | 597.83 | 477.58 | .00257 |
| .50 | 601.70 | 477.91 | .00260 |
| .51 | 605.51 | 478.24 | .00264 |
| .52 | 609.27 | 478.55 | .00268 |
| .53 | 612.98 | 478.87 | .00272 |
| .54 | 616.63 | 479.18 | .00276 |
| .55 | 620.23 | 479.49 | .00280 |
| .56 | 623.77 | 479.79 | .00284 |
| .57 | 627.29 | 480.08 | .00286 |
| .58 | 630.76 | 480.38 | .00289 |
| .59 | 634.20 | 480.67 | .00292 |
| .60 | 637.62 | 480.95 | .00294 |
| .61 | 641.01 | 481.24 | .00296 |
| .62 | 644.37 | 481.53 | .00298 |
| .63 | 647.72 | 481.81 | .00300 |
| .64 | 651.06 | 482.09 | .00301 |
| .65 | 654.38 | 482.37 | .00301 |
| .66 | 657.72 | 482.64 | .00301 |
| .67 | 661.05 | 482.92 | .00300 |
| .68 | 664.40 | 483.20 | .00298 |
| .69 | 667.75 | 483.47 | .00297 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | |
|---|---|---|---|
| .70 | 671.16 | 483.75 | .00293 |
| .71 | 674.59 | 484.04 | .00290 |
| .72 | 678.06 | 484.32 | .00286 |
| .73 | 681.60 | 484.61 | .00281 |
| .74 | 685.19 | 484.90 | .00276 |
| .75 | 688.86 | 485.20 | .00270 |
| .76 | 692.63 | 485.50 | .00262 |
| .77 | 696.50 | 485.81 | .00254 |
| .78 | 700.51 | 486.13 | .00246 |
| .79 | 704.65 | 486.47 | .00237 |
| .80 | 708.97 | 486.81 | .00227 |
| .81 | 713.45 | 487.17 | .00218 |
| .82 | 718.16 | 487.55 | .00208 |
| .83 | 723.08 | 487.95 | .00197 |
| .84 | 728.30 | 488.37 | .00186 |
| .85 | 733.83 | 488.81 | .00175 |
| .86 | 739.77 | 489.29 | .00162 |
| .87 | 746.21 | 489.81 | .00149 |
| .88 | 753.21 | 490.37 | .00137 |
| .89 | 760.81 | 490.99 | .00126 |
| .90 | 769.15 | 491.67 | .00113 |
| .91 | 778.53 | 492.43 | .00100 |
| .92 | 789.15 | 493.30 | .00088 |
| .93 | 801.42 | 494.31 | .00076 |
| .94 | 815.58 | 495.47 | .00065 |
| .95 | 832.46 | 496.87 | .00054 |
| .96 | 852.55 | 498.53 | .00044 |
| .97 | 877.39 | 500.59 | .00038 |
| .98 | 909.50 | 503.25 | .00026 |
| .99 | 956.65 | 507.17 | .00015 |

BENCH MARK AT .153 MIN. ( .153 MIN. SINCE LAST MARK) KINETIC IN CORE AT THIS MARK.

KINETIC ANALYSIS BY FRIEDMANS METHOD (OLD TGA3 SUBROUTINE).

| % CONV | EA(KCAL) | ST.DEVN. | LOG PREX | ST.DEVN. | AV.LOG AFC | ST.DEVN. | LOG(1-C)*100 |
|---|---|---|---|---|---|---|---|
| 4 | 20.055 | .567 | 6.429 | .564 | 6.357 | .0461 | 1.9823 |
| 5 | 20.367 | .485 | 6.587 | .480 | 6.371 | .0406 | 1.9777 |
| 6 | 20.143 | .379 | 6.498 | .374 | 6.386 | .0311 | 1.9731 |
| 7 | 20.063 | .414 | 6.476 | .406 | 6.401 | .0336 | 1.9685 |
| 8 | 20.349 | .306 | 6.614 | .299 | 6.409 | .0266 | 1.9638 |
| 9 | 20.159 | .276 | 6.539 | .269 | 6.421 | .0230 | 1.9590 |
| 10 | 20.318 | .273 | 6.617 | .265 | 6.427 | .0238 | 1.9542 |
| 11 | 20.446 | .217 | 6.680 | .210 | 6.433 | .0211 | 1.9494 |
| 12 | 20.408 | .215 | 6.670 | .208 | 6.441 | .0205 | 1.9445 |
| 13 | 20.462 | .177 | 6.698 | .170 | 6.445 | .0187 | 1.9395 |
| 14 | 20.422 | .169 | 6.685 | .162 | 6.450 | .0177 | 1.9345 |
| 15 | 20.498 | .178 | 6.722 | .170 | 6.454 | .0193 | 1.9294 |
| 16 | 20.588 | .193 | 6.764 | .185 | 6.456 | .0215 | 1.9243 |
| 17 | 20.520 | .198 | 6.737 | .189 | 6.460 | .0208 | 1.9191 |
| 18 | 20.439 | .187 | 6.706 | .179 | 6.465 | .0190 | 1.9138 |

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 19 | 20.442 | .145 | 6.711 | .138 | 6.470 | .0165 | 1.9085 |
| 20 | 20.547 | .139 | 6.757 | .132 | 6.470 | .0179 | 1.9031 |
| 21 | 20.514 | .138 | 6.745 | .131 | 6.472 | .0173 | 1.8976 |
| 22 | 20.413 | .153 | 6.704 | .145 | 6.476 | .0155 | 1.8921 |
| 23 | 20.459 | .139 | 6.724 | .132 | 6.477 | .0164 | 1.8855 |
| 24 | 20.379 | .148 | 6.691 | .140 | 6.479 | .0157 | 1.8806 |
| 25 | 20.388 | .136 | 6.696 | .129 | 6.481 | .0152 | 1.8751 |
| 26 | 20.348 | .126 | 6.680 | .118 | 6.483 | .0140 | 1.8692 |
| 27 | 20.299 | .126 | 6.661 | .119 | 6.485 | .0133 | 1.8633 |
| 28 | 20.337 | .111 | 6.699 | .104 | 6.485 | .0138 | 1.8573 |
| 29 | 20.395 | .138 | 6.703 | .129 | 6.486 | .0154 | 1.8513 |
| 30 | 20.551 | .091 | 6.770 | .085 | 6.484 | .0158 | 1.8451 |
| 31 | 21.298 | .235 | 7.087 | .220 | 6.475 | .0356 | 1.8388 |
| 32 | 20.405 | .088 | 6.709 | .082 | 6.488 | .0130 | 1.8325 |
| 33 | 20.191 | .104 | 6.620 | .097 | 6.493 | .0104 | 1.8261 |
| 34 | 20.177 | .103 | 6.614 | .096 | 6.493 | .0102 | 1.8195 |
| 35 | 20.147 | .118 | 6.601 | .110 | 6.493 | .0109 | 1.8129 |
| 36 | 20.068 | .122 | 6.568 | .113 | 6.495 | .0104 | 1.8062 |
| 37 | 20.007 | .120 | 6.543 | .112 | 6.496 | .0099 | 1.7993 |
| 38 | 19.995 | .130 | 6.537 | .121 | 6.496 | .0106 | 1.7924 |
| 39 | 20.024 | .138 | 6.549 | .128 | 6.495 | .0114 | 1.7853 |
| 40 | 20.041 | .143 | 6.555 | .132 | 6.494 | .0118 | 1.7782 |
| 41 | 20.003 | .146 | 6.539 | .135 | 6.494 | .0119 | 1.7709 |
| 42 | 19.950 | .146 | 6.516 | .135 | 6.494 | .0117 | 1.7634 |
| 43 | 19.845 | .136 | 6.472 | .126 | 6.495 | .0110 | 1.7559 |
| 44 | 19.763 | .135 | 6.436 | .125 | 6.496 | .0112 | 1.7482 |
| 45 | 19.740 | .131 | 6.426 | .121 | 6.495 | .0110 | 1.7404 |
| 46 | 19.717 | .127 | 6.416 | .118 | 6.495 | .0109 | 1.7324 |
| 47 | 19.652 | .131 | 6.387 | .120 | 6.494 | .0118 | 1.7243 |
| 48 | 19.577 | .135 | 6.354 | .124 | 6.494 | .0129 | 1.7160 |
| 49 | 19.521 | .135 | 6.330 | .124 | 6.493 | .0136 | 1.7076 |
| 50 | 19.473 | .132 | 6.309 | .122 | 6.492 | .0141 | 1.6990 |
| 51 | 19.427 | .132 | 6.288 | .122 | 6.491 | .0148 | 1.6902 |
| 52 | 19.381 | .135 | 6.267 | .124 | 6.489 | .0157 | 1.6812 |
| 53 | 19.329 | .138 | 6.242 | .127 | 6.487 | .0167 | 1.6721 |
| 54 | 19.264 | .144 | 6.213 | .132 | 6.485 | .0180 | 1.6628 |
| 55 | 19.188 | .149 | 6.178 | .137 | 6.483 | .0196 | 1.6532 |
| 56 | 19.116 | .148 | 6.146 | .136 | 6.481 | .0203 | 1.6435 |
| 57 | 19.059 | .146 | 6.119 | .134 | 6.478 | .0213 | 1.6335 |
| 58 | 19.001 | .150 | 6.091 | .137 | 6.475 | .0230 | 1.6232 |
| 59 | 18.950 | .157 | 6.066 | .144 | 6.472 | .0243 | 1.6128 |
| 60 | 18.901 | .164 | 6.041 | .150 | 6.467 | .0255 | 1.6021 |
| 61 | 18.848 | .172 | 6.014 | .157 | 6.463 | .0269 | 1.5911 |
| 62 | 18.795 | .178 | 5.987 | .162 | 6.458 | .0281 | 1.5796 |
| 63 | 18.734 | .183 | 5.956 | .167 | 6.453 | .0295 | 1.5682 |
| 64 | 18.679 | .187 | 5.927 | .170 | 6.447 | .0307 | 1.5563 |
| 65 | 18.640 | .192 | 5.904 | .175 | 6.440 | .0317 | 1.5441 |
| 66 | 18.590 | .201 | 5.876 | .183 | 6.433 | .0330 | 1.5315 |
| 67 | 18.545 | .204 | 5.850 | .185 | 6.425 | .0340 | 1.5185 |
| 68 | 18.496 | .201 | 5.822 | .182 | 6.417 | .0348 | 1.5051 |
| 69 | 18.437 | .196 | 5.788 | .178 | 6.408 | .0355 | 1.4914 |
| 70 | 18.412 | .187 | 5.768 | .170 | 6.398 | .0360 | 1.4771 |
| 71 | 18.396 | .184 | 5.750 | .167 | 6.387 | .0363 | 1.4624 |
| 72 | 18.363 | .184 | 5.724 | .166 | 6.375 | .0369 | 1.4472 |
| 73 | 18.336 | .177 | 5.700 | .160 | 6.362 | .0373 | 1.4314 |
| 74 | 18.312 | .174 | 5.677 | .158 | 6.348 | .0377 | 1.4150 |
| 75 | 18.338 | .175 | 5.673 | .159 | 6.333 | .0372 | 1.3979 |

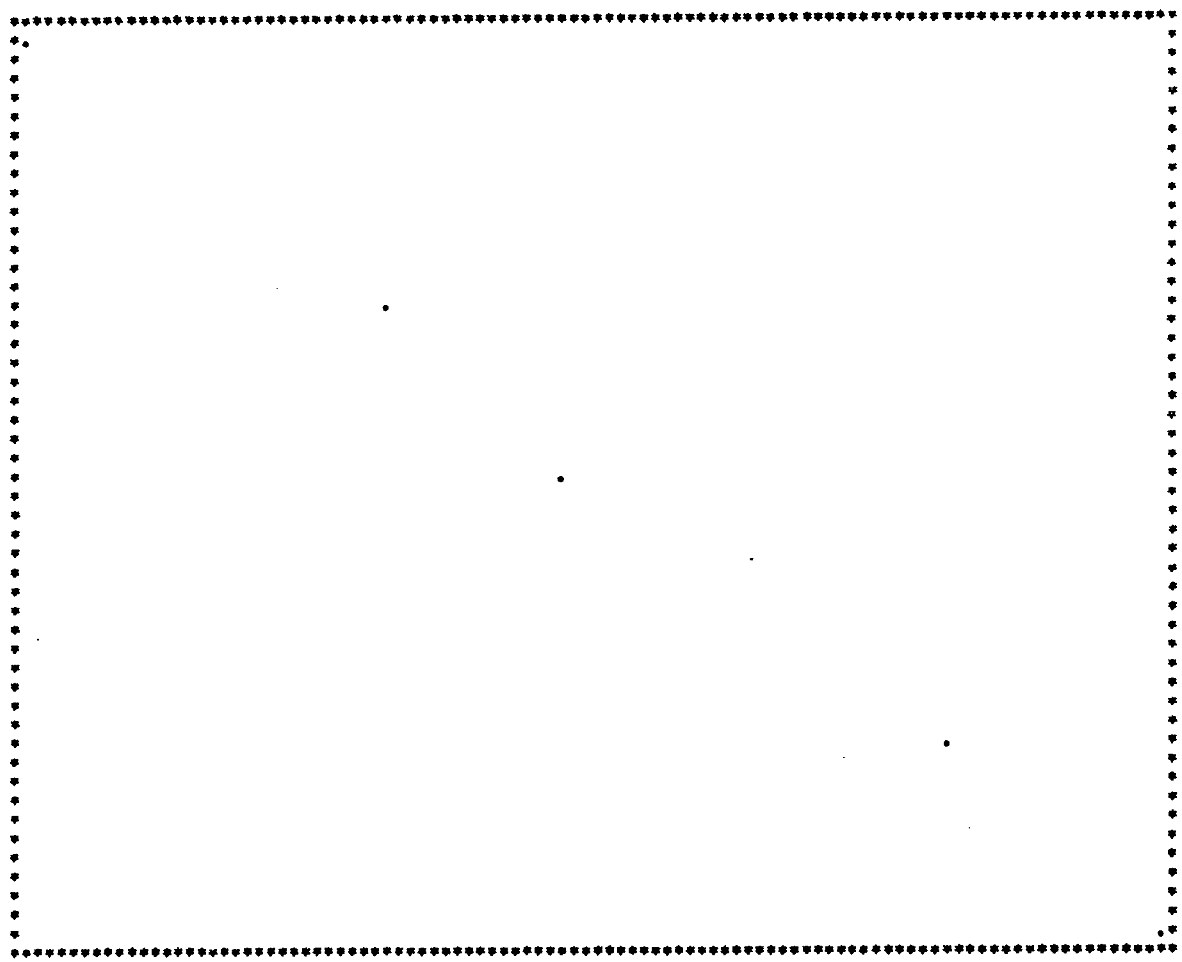
KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 76 | 18.354 | .176 | 5.663 | .159 | 6.315 | .0369 | 1.3802 |
| 77 | 18.349 | .175 | 5.643 | .158 | 6.297 | .0370 | 1.3617 |
| 78 | 18.362 | .164 | 5.629 | .148 | 6.277 | .0364 | 1.3424 |
| 79 | 18.355 | .148 | 5.605 | .133 | 6.256 | .0361 | 1.3222 |
| 80 | 18.342 | .129 | 5.578 | .117 | 6.234 | .0359 | 1.3010 |
| 81 | 18.348 | .132 | 5.557 | .119 | 6.209 | .0359 | 1.2788 |
| 82 | 18.370 | .140 | 5.539 | .126 | 6.182 | .0356 | 1.2553 |
| 83 | 18.399 | .147 | 5.522 | .132 | 6.151 | .0352 | 1.2304 |
| 84 | 18.445 | .155 | 5.509 | .139 | 6.119 | .0345 | 1.2041 |
| 85 | 18.467 | .154 | 5.485 | .139 | 6.085 | .0341 | 1.1761 |
| 86 | 18.502 | .152 | 5.462 | .136 | 6.047 | .0333 | 1.1461 |
| 87 | 18.602 | .148 | 5.462 | .132 | 6.005 | .0311 | 1.1139 |
| 88 | 18.657 | .172 | 5.440 | .153 | 5.959 | .0309 | 1.0792 |
| 89 | 18.709 | .201 | 5.413 | .180 | 5.909 | .0311 | 1.0414 |
| 90 | 18.780 | .230 | 5.387 | .205 | 5.853 | .0311 | 1.0000 |
| 91 | 18.913 | .235 | 5.380 | .209 | 5.790 | .0291 | .9542 |
| 92 | 18.966 | .281 | 5.337 | .249 | 5.724 | .0309 | .9031 |
| 93 | 19.014 | .314 | 5.277 | .279 | 5.644 | .0324 | .8451 |
| 94 | 19.125 | .370 | 5.237 | .327 | 5.557 | .0349 | .7782 |
| 95 | 19.110 | .433 | 5.133 | .382 | 5.458 | .0396 | .6990 |
| 96 | 19.327 | .482 | 5.110 | .423 | 5.345 | .0416 | .6021 |
| 97 | 18.964 | .584 | 4.829 | .510 | 5.211 | .0522 | .4771 |
| 98 | 19.337 | .635 | 4.798 | .553 | 5.026 | .0537 | .3010 |

AVERAGE ACTIVATION ENERGY = 19.900
AVERAGE LOG PREX = 6.489
BOTH FOR 20-60 PERCENT CONVERSION

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

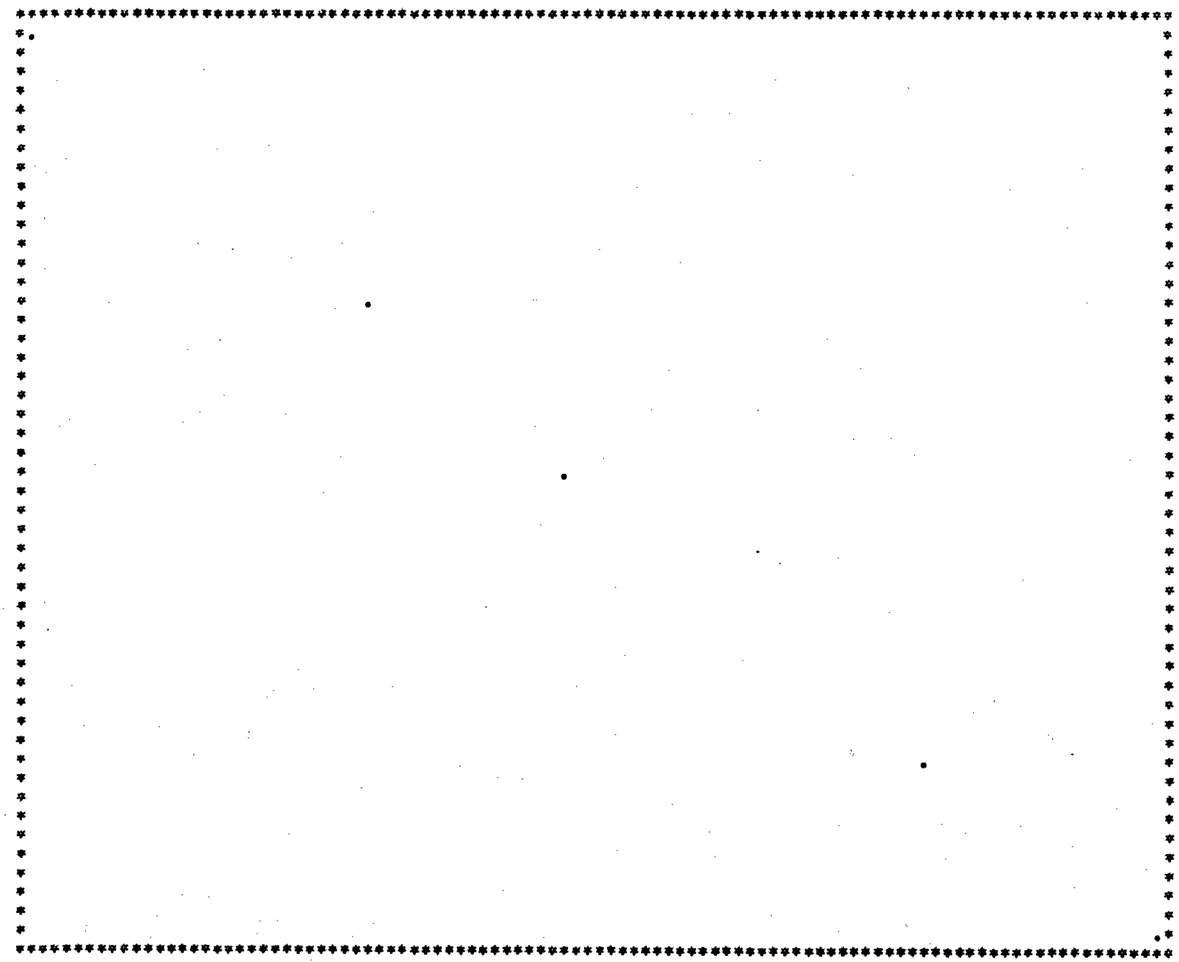
LOG RATE VS 1/TEMP
CONVERSION = 10



XMIN = .19450434E-02 XMAX = .21964634E-02 YMIN = -.31485902E+01 YMAX = -.20204507E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

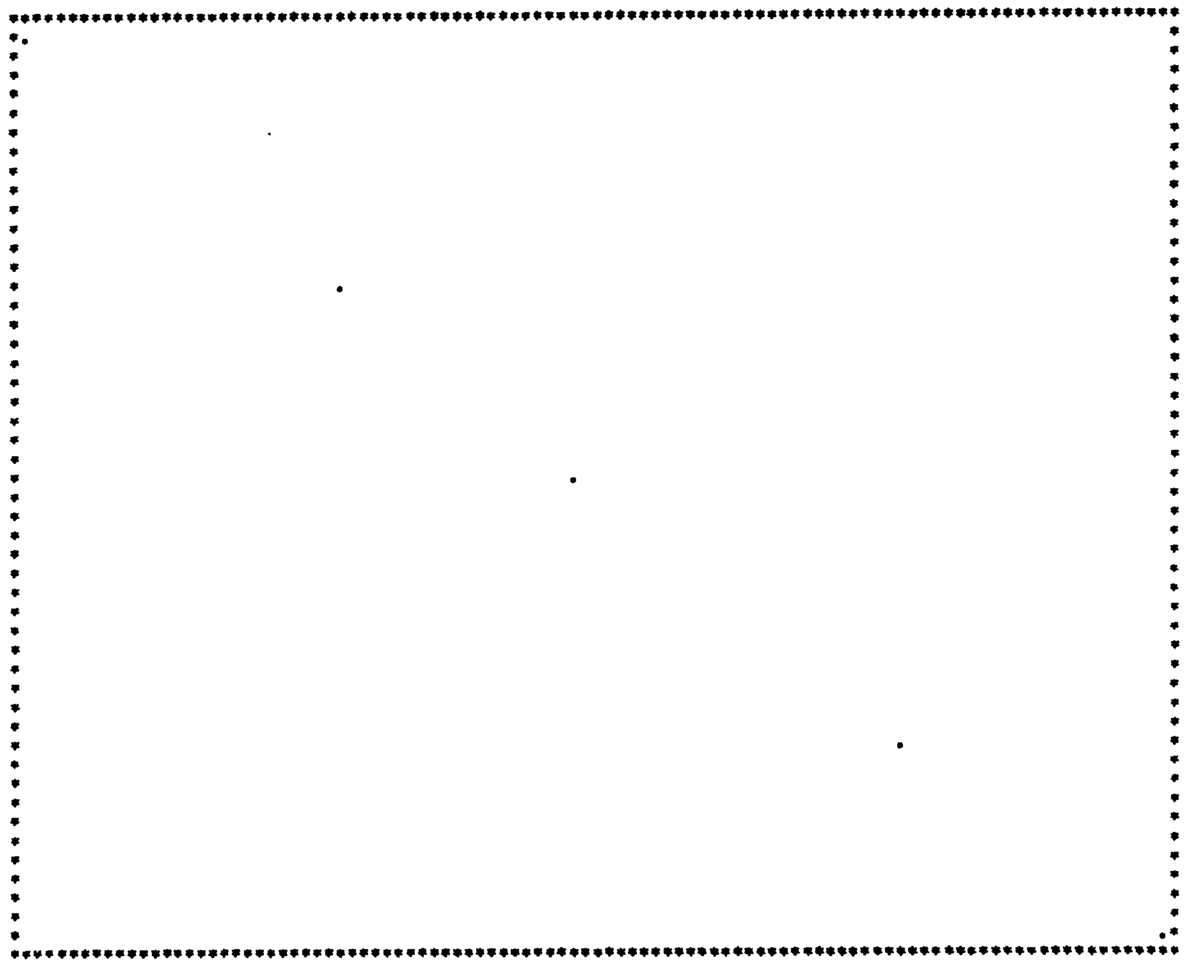
LOG RATE VS 1/TEMP
CONVERSION = 20



XMIN = .19045862E-02 XMAX = .21548153E-02 YMIN = -.29092216E+01 YMAX = -.17908683E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

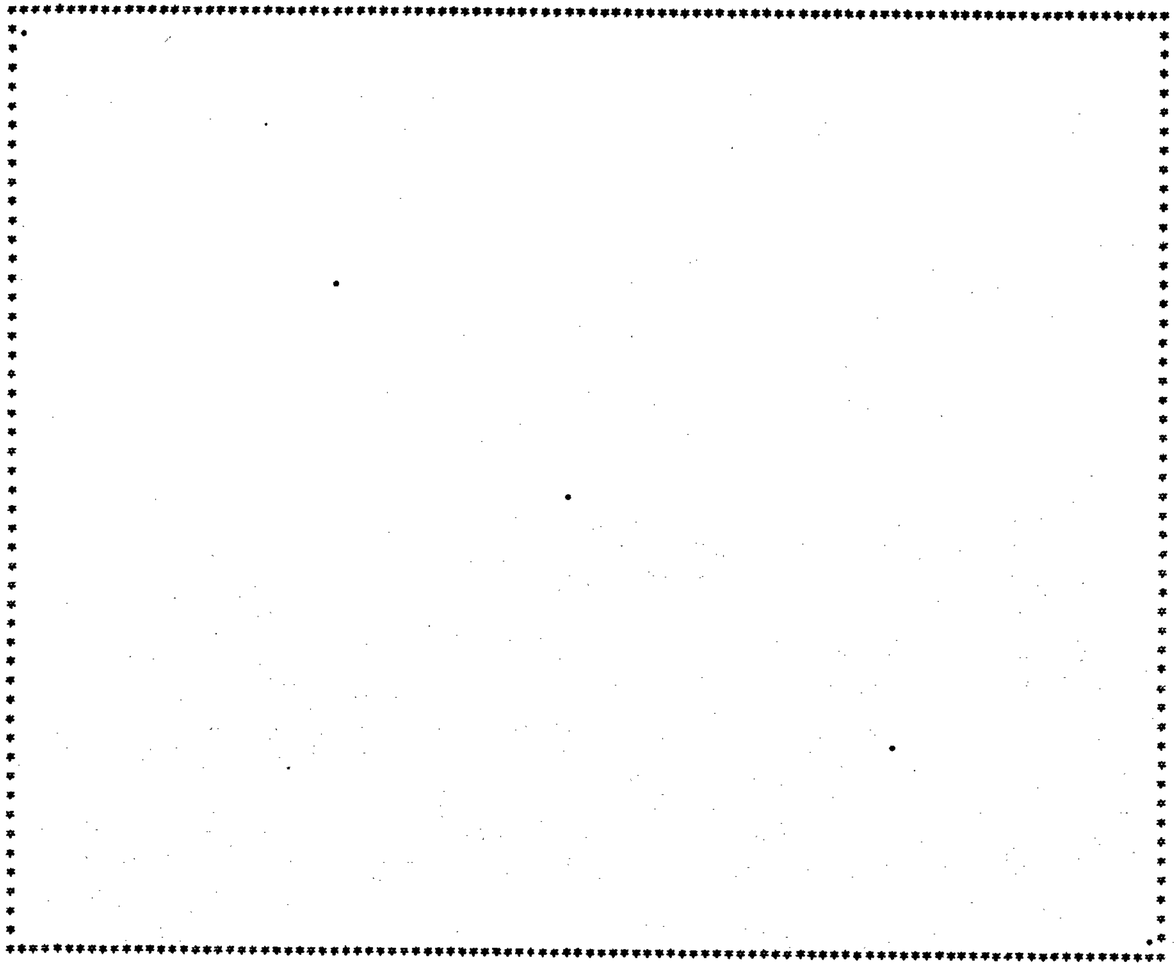
LOG RATE VS 1/TEMP
CONVERSION = 30



XMIN = .18779835E-02 XMAX = .21282555E-02 YMIN = -.27831274E+01 YMAX = -.16631890E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

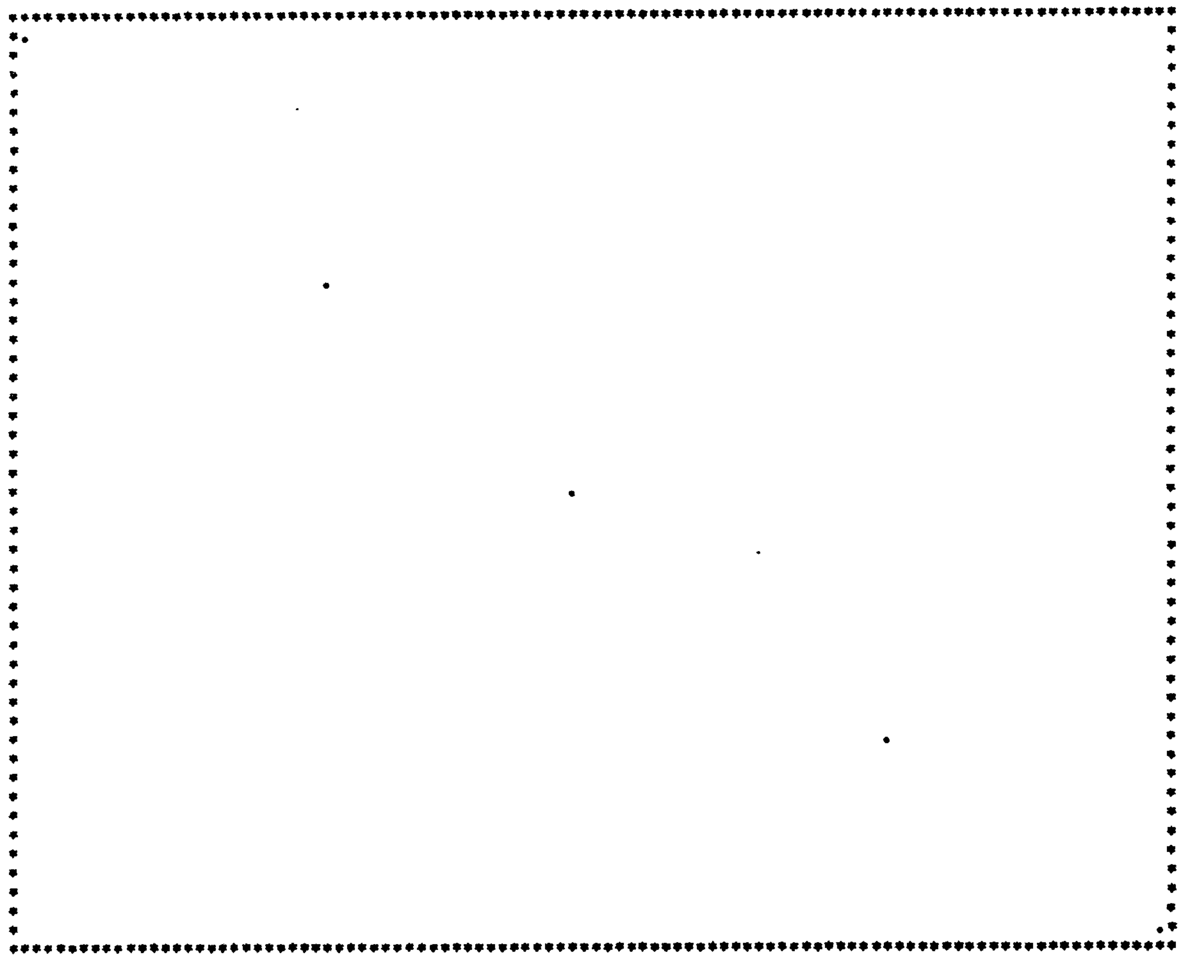
LOG RATE VS 1/TEMP
CONVERSION = 40



XMIN = .18575959E-02 XMAX = .21081362E-02 YMIN = -.26648222E+01 YMAX = -.15754425E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

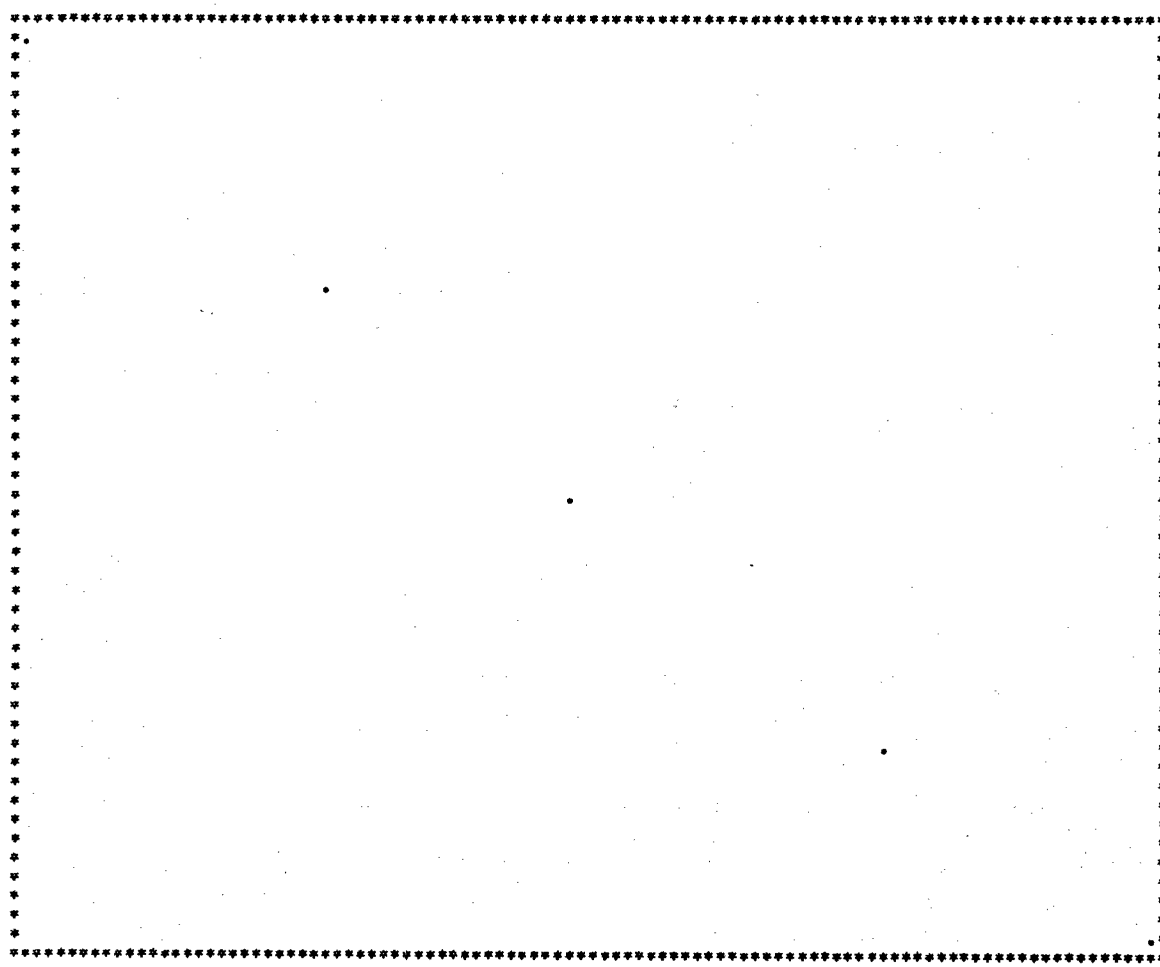
LOG RATE VS 1/TEMP
CONVERSION = 50



XMIN = .18407733E-02 XMAX = .20924328E-02 YMIN = -.25844744E+01 YMAX = -.15185473E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

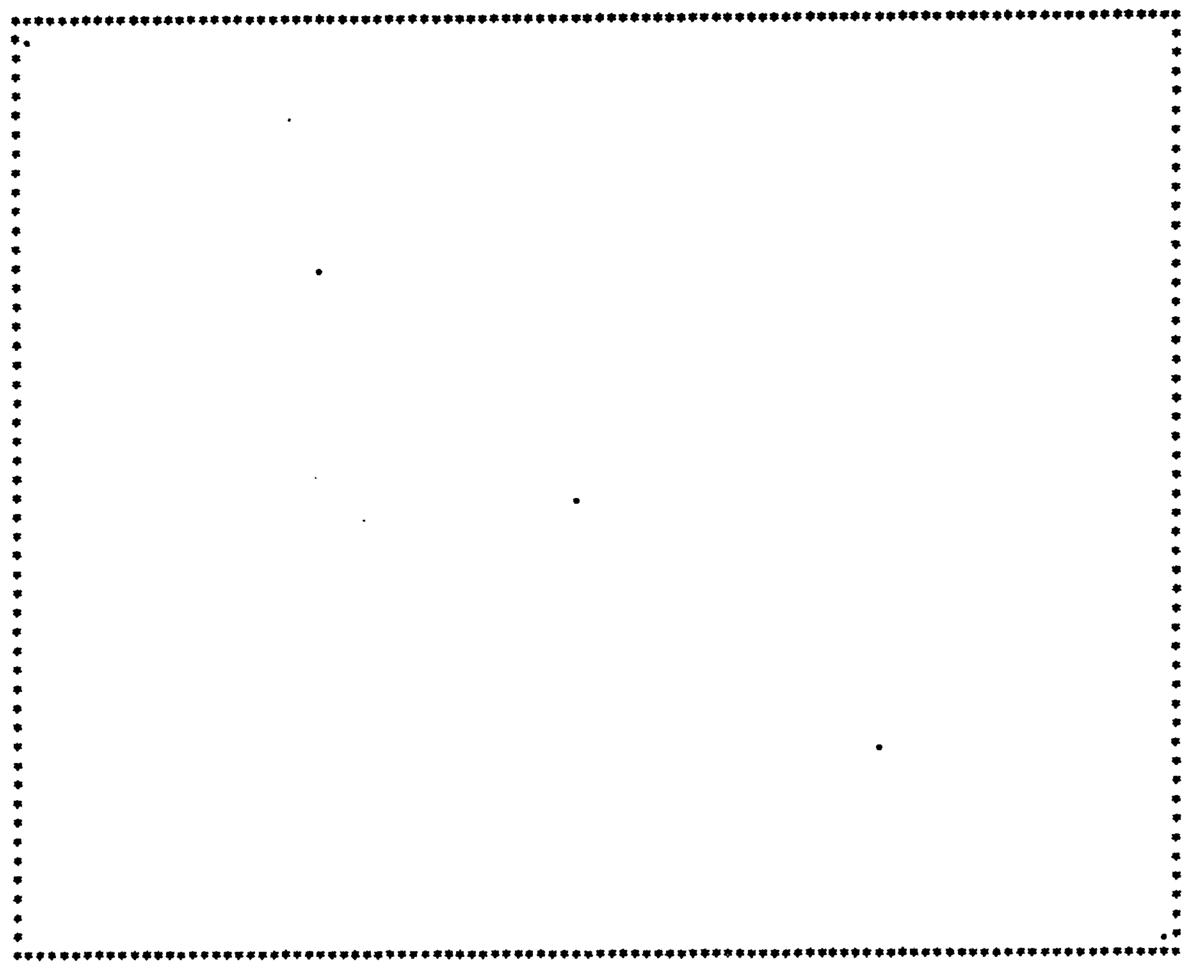
LOG RATE VS 1/TEMP
CONVERSION = 50



XMIN = .18263741E-02 XMAX = .20791856E-02 YMIN = -.25316745E+01 YMAX = -.14935119E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

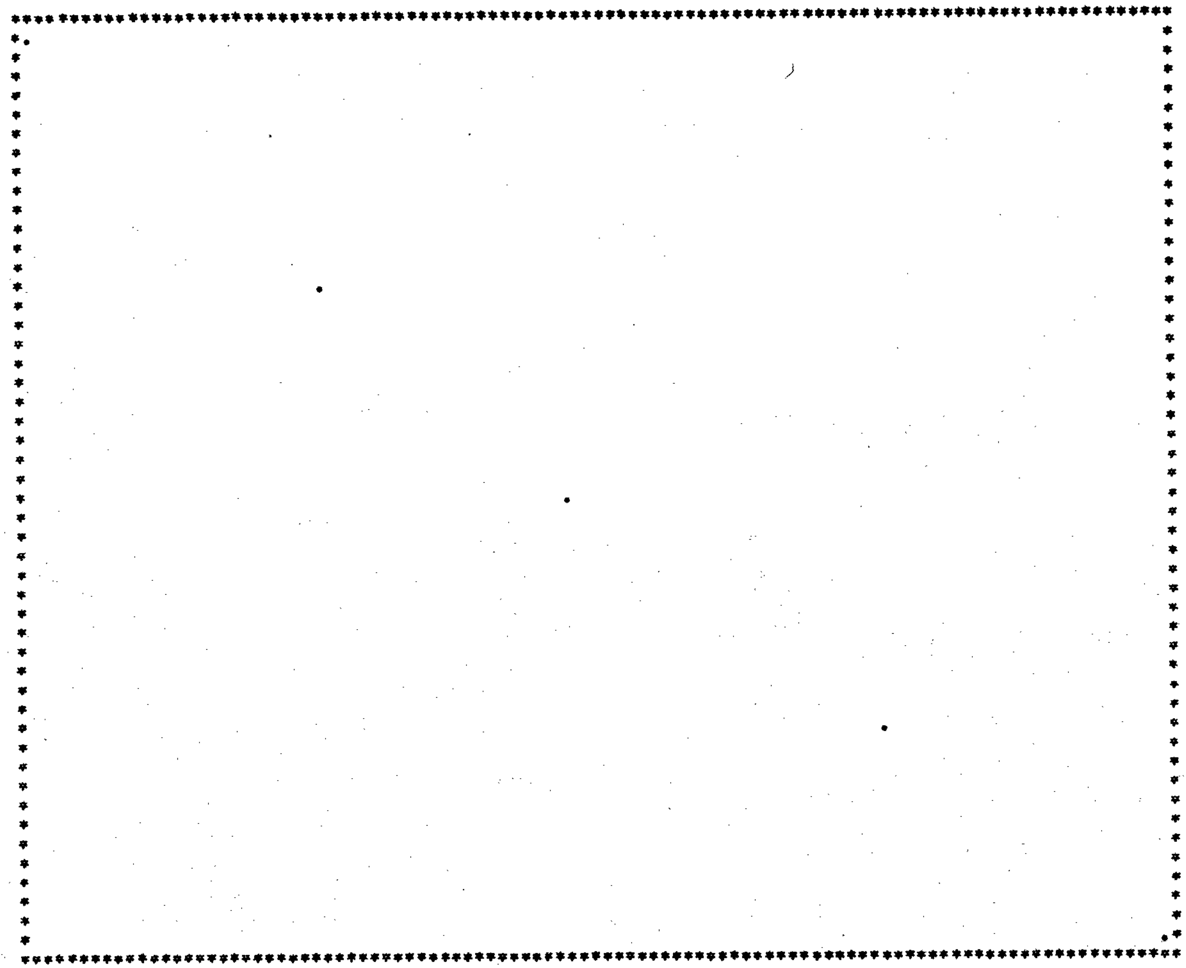
LOG RATE VS 1/TEMP
CONVERSION = 70



XMIN = .18124195E-02 XMAX = .20671672E-02 YMIN = -.25326664E+01 YMAX = -.15167050E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

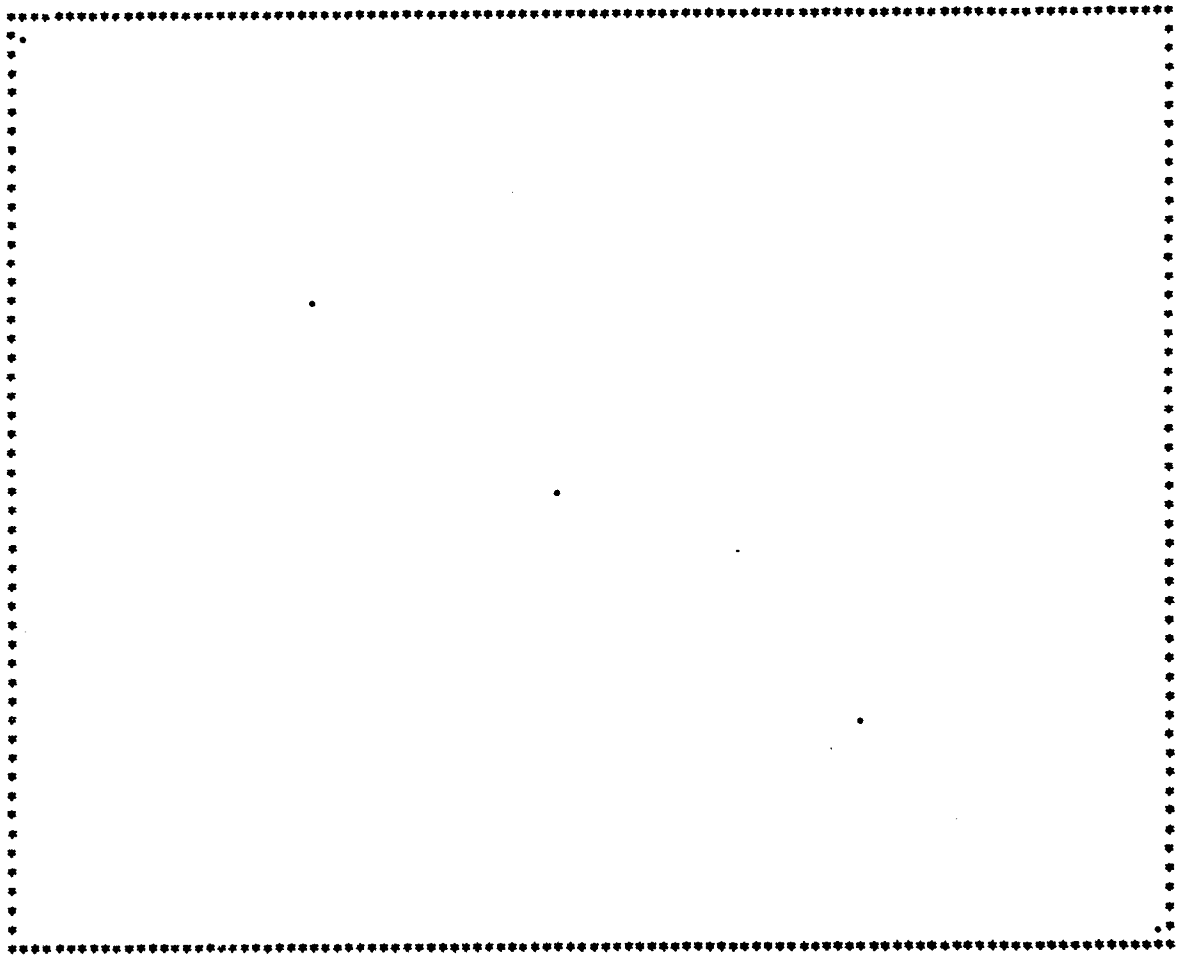
LOG RATE VS 1/T=MP
CONVERSION = 80



XMIN = .17979204E-02 XMAX = .23541750E-02 YMIN = -.26431449E+01 YMAX = -.16208398E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

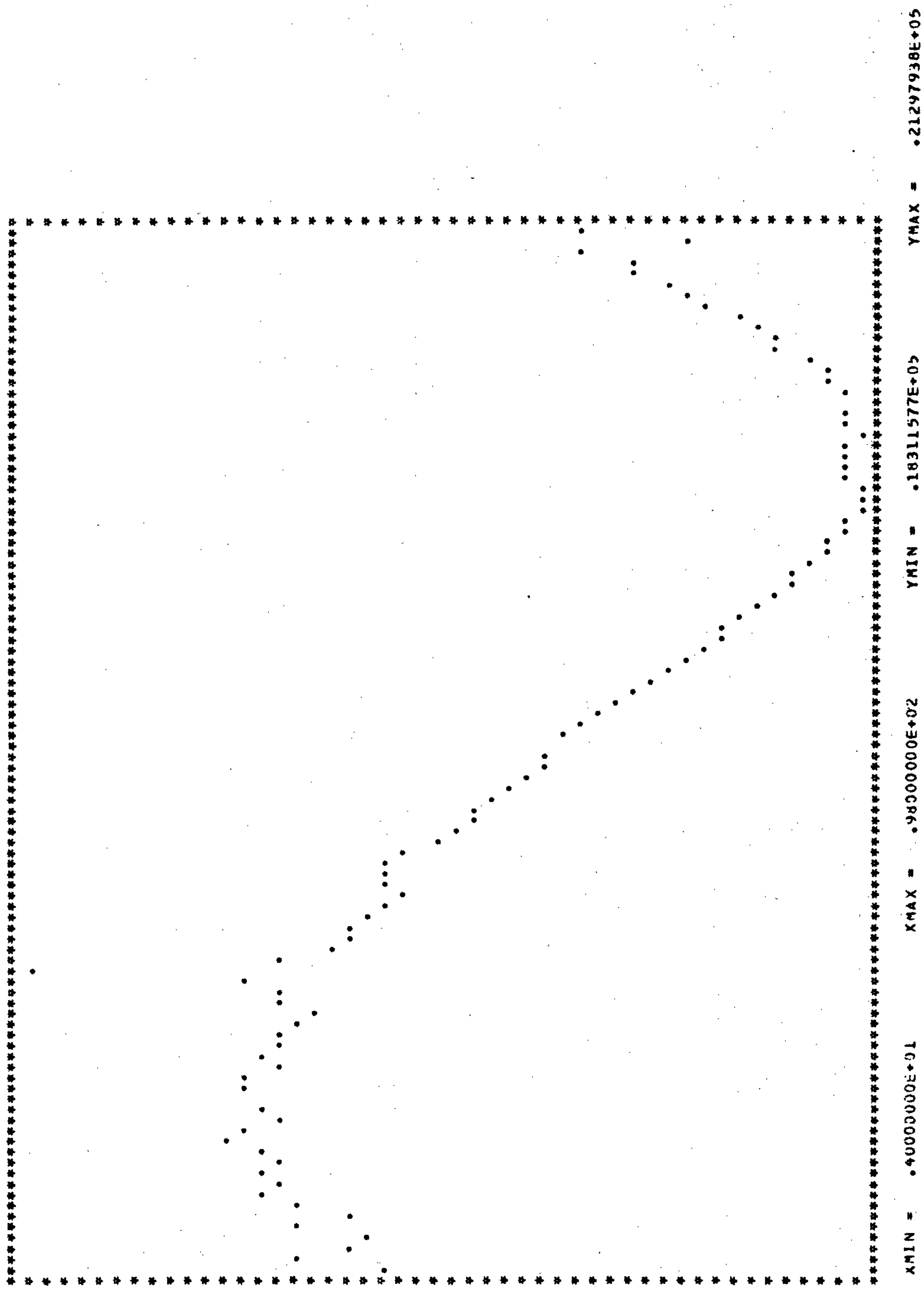
LOG RATE VS 1/TEMP
CONVERSION = 90

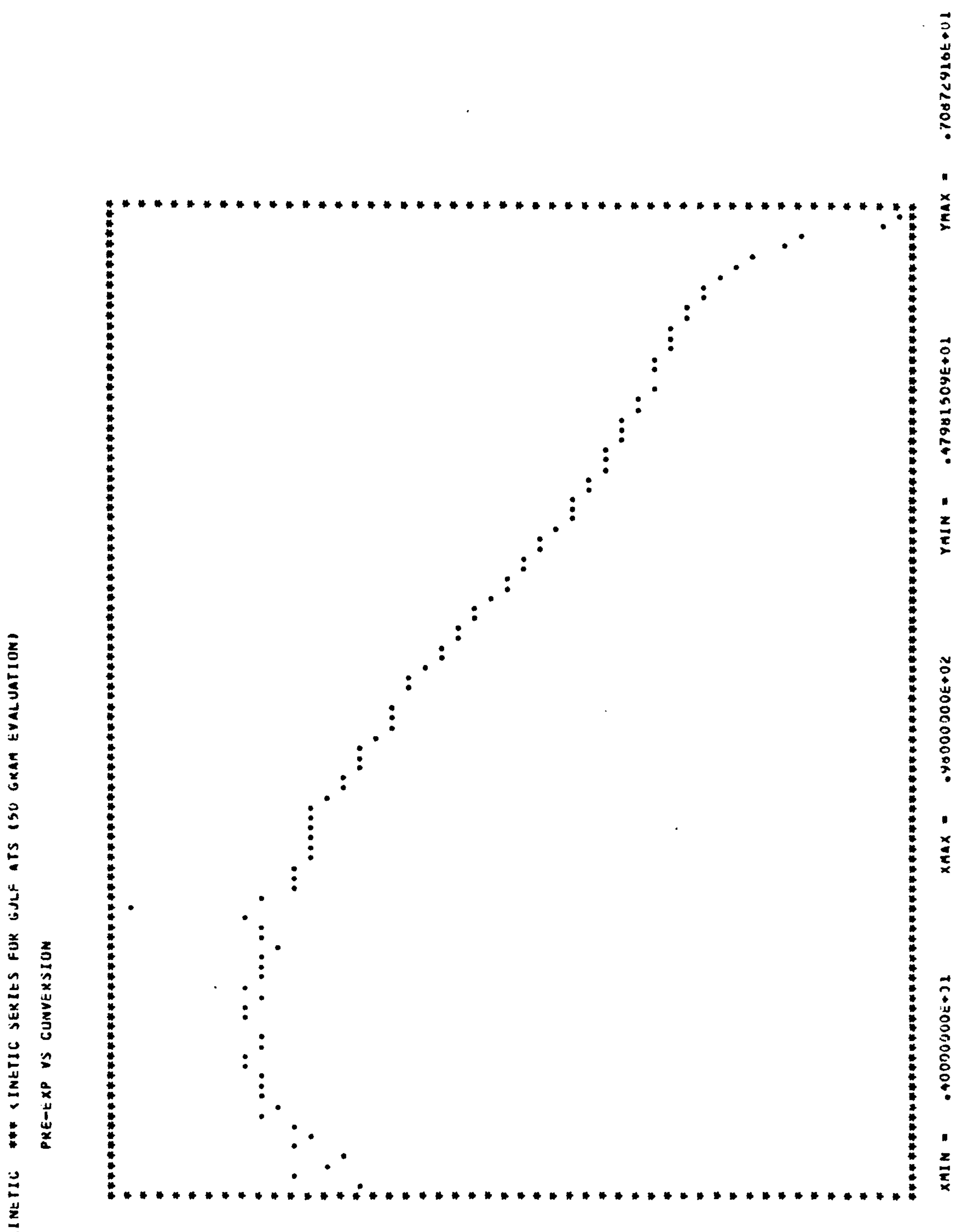


XMIN = .17767982E-02 XMAX = .20338812E-02 YMIN = -.29455058E+01 YMAX = -.18817536E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

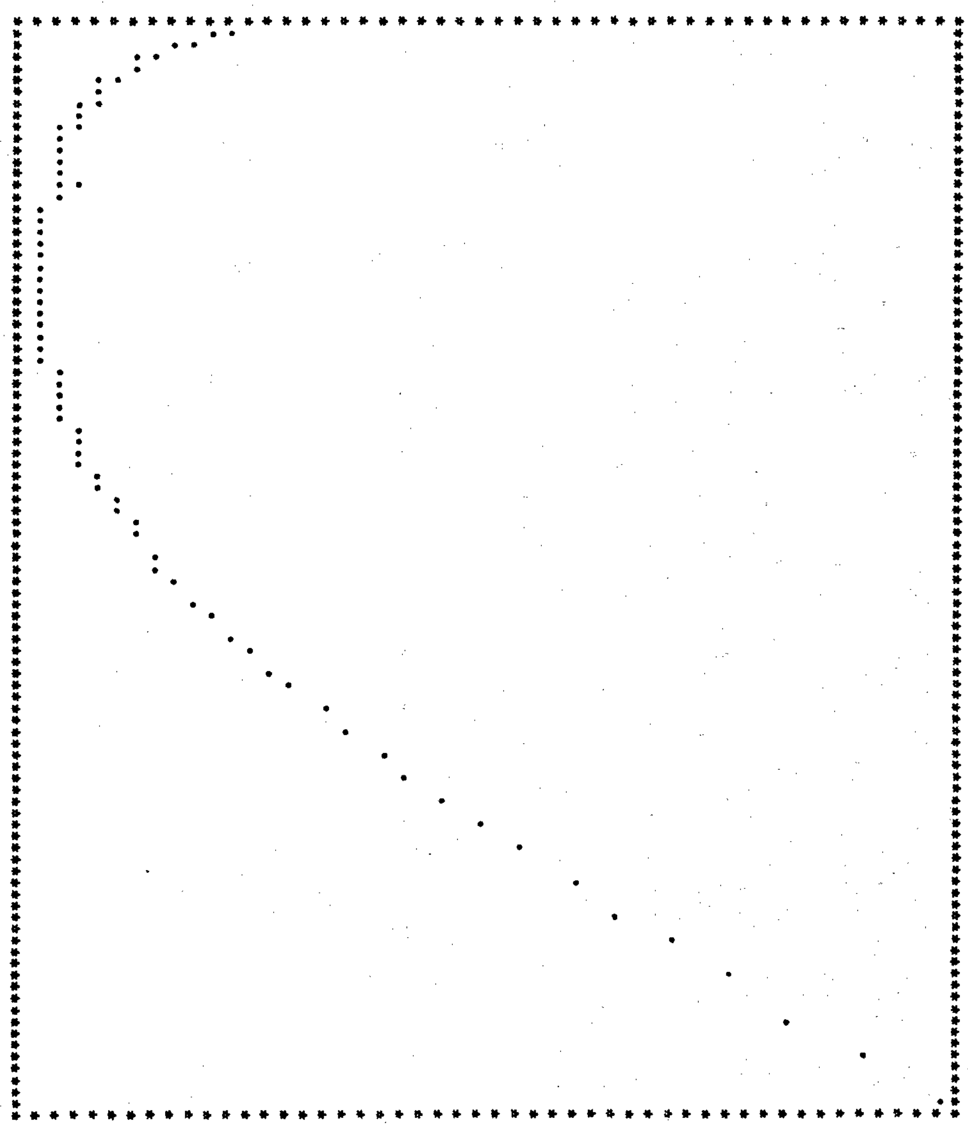
ACTIVATION ENERGY VS CONVERSION




KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)
PRE-EXP VS CONVERSION
XMIN = .40000000E+01
XMAX = .98000000E+02
YMIN = .47981509E+01
YMAX = .70872916E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

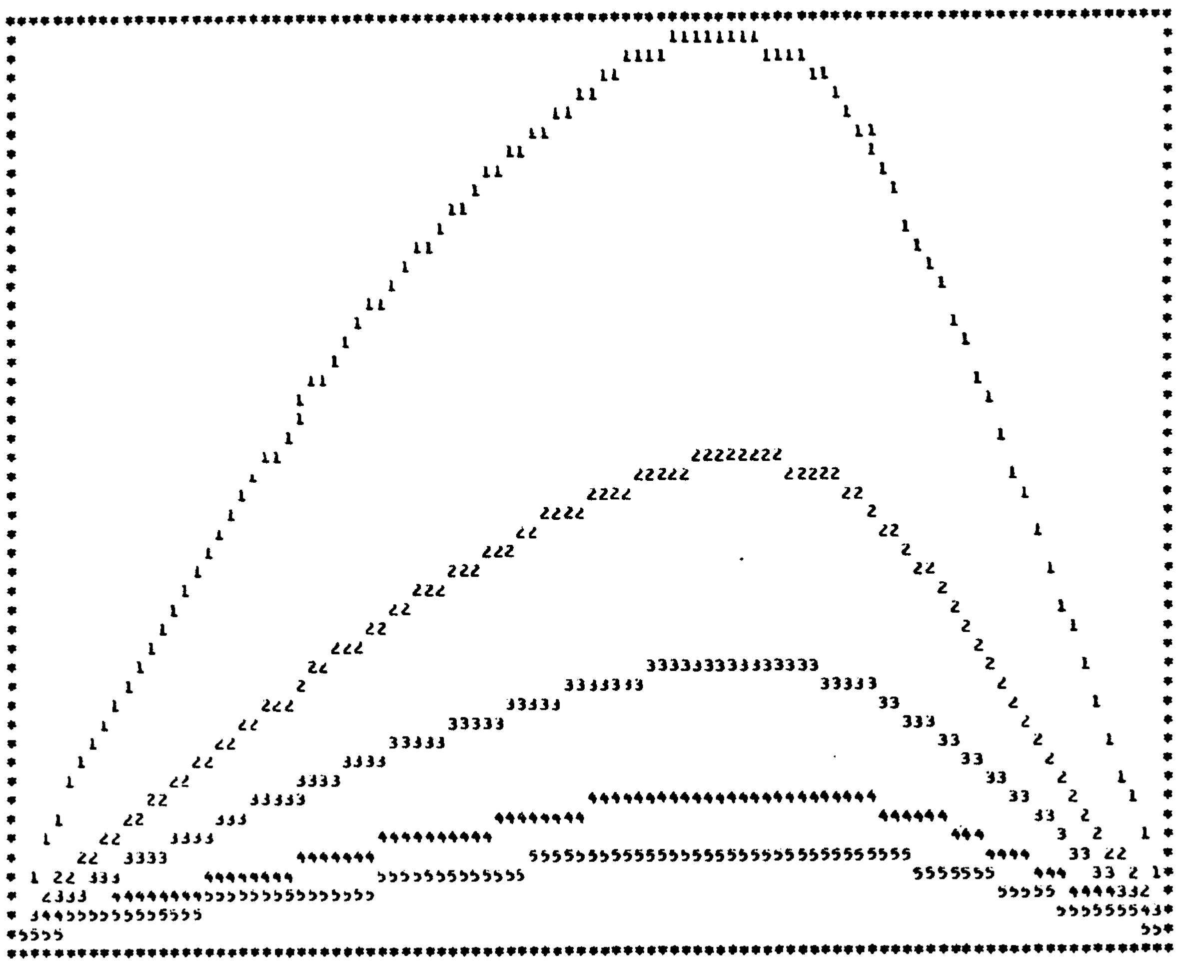
AVER LOG AF(C) VS LOG CONVERSION REMAINING



XMIN = .10000000E+01 XMAX = .19322712E+01 YMIN = .58532690E+01 YMAX = .64961707E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

COMPOUNDED RATE OF CONVERSION VS. CONVERSION



XMIN = 0.    XMAX = .99000000E+02    YMIN = 0.    YMAX = .32108535E-01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

THE ORDER OF THE REACTION IS: .34 THIS VALUE IS CALCULATED FROM

THE AVERAGE LOG F(C) VERSUS (1-C)

LOG OF PRE-EXPONENTIAL FACTOR= 6.5440

AVERAGE ACTIVATION ENERGY IS: 19.900

AVERAGE HEAT OF REACTION IS: 104.22 STANDARD DEVIATION: 5.20

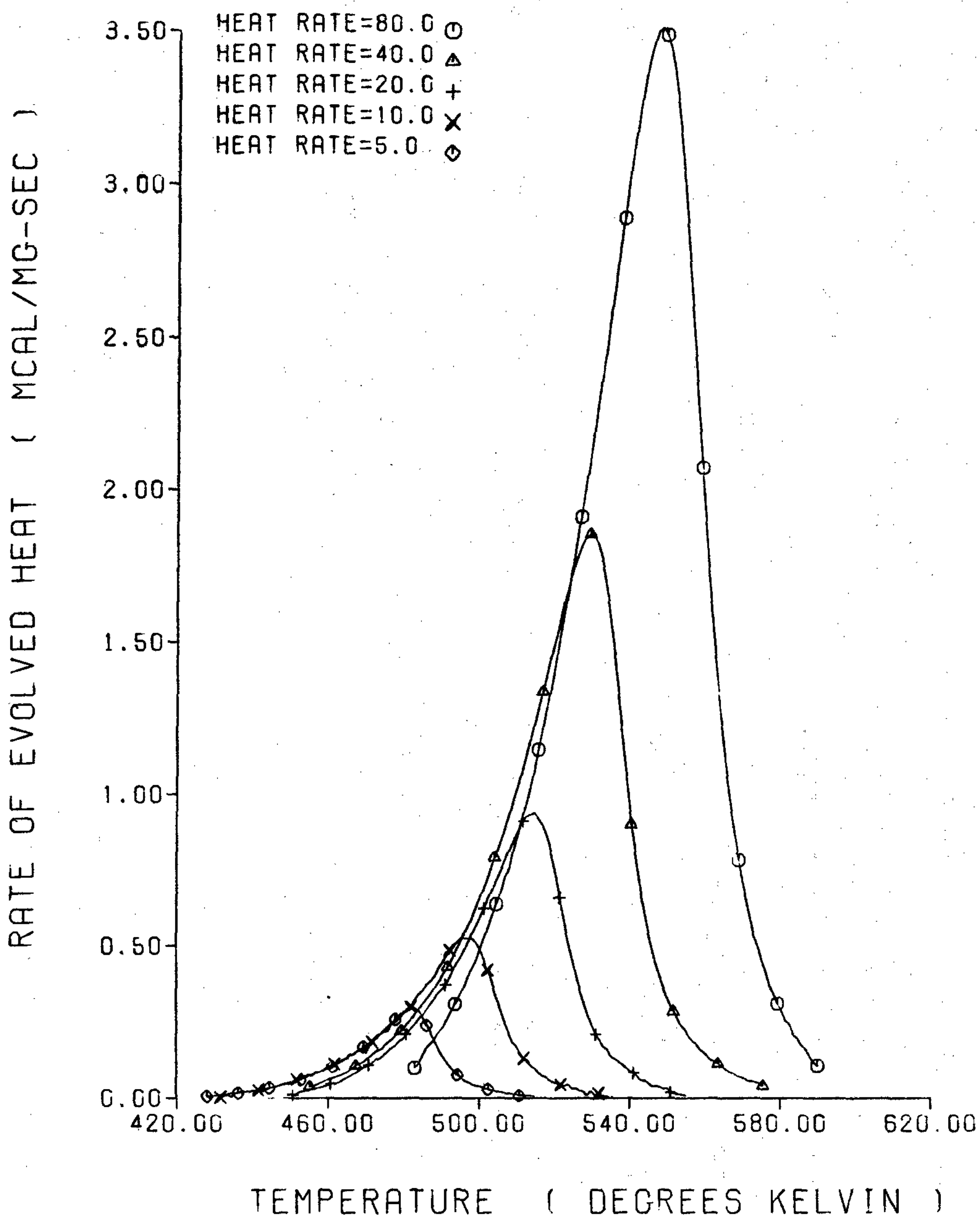
| % CONV | EA(KCAL) | ST.DEVN. | LOG PREX | ST.DEVN. | AV.LOG AFC | ST.DEVN. |
|---|---|---|---|---|---|---|
| 5 | 20.367 | .485 | 6.587 | .480 | 6.371 | .0406 |
| 10 | 20.318 | .273 | 6.617 | .265 | 6.427 | .0238 |
| 15 | 20.498 | .178 | 6.722 | .170 | 6.454 | .0193 |
| 20 | 20.547 | .139 | 6.757 | .132 | 6.470 | .0179 |
| 25 | 20.388 | .136 | 6.696 | .129 | 6.481 | .0152 |
| 30 | 20.551 | .091 | 6.770 | .085 | 6.484 | .0158 |
| 35 | 20.147 | .118 | 6.601 | .110 | 6.493 | .0109 |
| 40 | 20.041 | .143 | 6.555 | .132 | 6.494 | .0118 |
| 45 | 19.740 | .131 | 6.426 | .121 | 6.495 | .0110 |
| 50 | 19.473 | .132 | 5.309 | .122 | 6.492 | .0141 |
| 55 | 19.188 | .149 | 6.178 | .137 | 6.483 | .0196 |
| 60 | 18.901 | .164 | 6.041 | .150 | 6.467 | .0255 |
| 65 | 18.640 | .192 | 5.904 | .175 | 6.440 | .0317 |
| 70 | 18.412 | .187 | 5.768 | .170 | 6.398 | .0360 |
| 75 | 18.338 | .175 | 5.673 | .159 | 6.333 | .0372 |
| 80 | 18.342 | .129 | 5.578 | .117 | 6.234 | .0359 |
| 85 | 18.467 | .154 | 5.485 | .139 | 6.085 | .0341 |
| 90 | 18.780 | .230 | 5.387 | .205 | 5.853 | .0311 |
| 95 | 19.110 | .433 | 5.133 | .382 | 5.458 | .0396 |

# APPENDIX B.4

## PROGRAM KINETIC

## SAMPLE OUTPUT PLOT

KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)



# APPENDIX C.1

## PROGRAM CURE

## SAMPLE INPUT LISTING

| PERCENT | AFC |
|---|---|
| 4 | .22738074E+07 |
| 5 | .23515481E+07 |
| 6 | .24327397E+07 |
| 7 | .25166769E+07 |
| 8 | .25652591E+07 |
| 9 | .26368209E+07 |
| 10 | .26727999E+07 |
| 11 | .27127953E+07 |
| 12 | .27599353E+07 |
| 13 | .27884618E+07 |
| 14 | .28199494E+07 |
| 15 | .28420162E+07 |
| 16 | .28558923E+07 |
| 17 | .28849835E+07 |
| 18 | .29187519E+07 |
| 19 | .29486649E+07 |
| 20 | .29491786E+07 |
| 21 | .29666067E+07 |
| 22 | .29956269E+07 |
| 23 | .29992366E+07 |
| 24 | .30164546E+07 |
| 25 | .30267524E+07 |
| 26 | .30423478E+07 |
| 27 | .30581706E+07 |
| 28 | .30577325E+07 |
| 29 | .30601862E+07 |
| 30 | .30500511E+07 |
| 31 | .29878389E+07 |
| 32 | .30792629E+07 |
| 33 | .31093431E+07 |
| 34 | .31142447E+07 |
| 35 | .31142713E+07 |
| 36 | .31252837E+07 |
| 37 | .31345174E+07 |
| 38 | .31324466E+07 |
| 39 | .31244527E+07 |
| 40 | .31180040E+07 |
| 41 | .31200509E+07 |
| 42 | .31221499E+07 |
| 43 | .31292697E+07 |
| 44 | .31306019E+07 |
| 45 | .31279903E+07 |
| 46 | .31231982E+07 |
| 47 | .31189853E+07 |
| 48 | .31158618E+07 |
| 49 | .31105374E+07 |
| 50 | .31042840E+07 |
| 51 | .30969672E+07 |
| 52 | .30857187E+07 |
| 53 | .30709962E+07 |
| 54 | .30561041E+07 |
| 55 | .30420570E+07 |
| 56 | .30273463E+07 |
| 57 | .30086715E+07 |
| 58 | .29870385E+07 |
| 59 | .29619491E+07 |
| 60 | .29341015E+07 |
| 61 | .29033402E+07 |
| 62 | .28694670E+07 |
| 63 | .28349742E+07 |
| 64 | .27974740E+07 |
| 65 | .27544551E+07 |
| 66 | .27092683E+07 |
| 67 | .26613993E+07 |

| | |
|---|---|
| 68 | .26113075E+07 |
| 69 | .25604960E+07 |
| 70 | .25026545E+07 |
| 71 | .24377786E+07 |
| 72 | .23702077E+07 |
| 73 | .23013382E+07 |
| 74 | .22308047E+07 |
| 75 | .21521272E+07 |
| 76 | .20669165E+07 |
| 77 | .19796255E+07 |
| 78 | .18910669E+07 |
| 79 | .18032011E+07 |
| 80 | .17135667E+07 |
| 81 | .16178828E+07 |
| 82 | .15194932E+07 |
| 83 | .14172920E+07 |
| 84 | .13157593E+07 |
| 85 | .12159430E+07 |
| 86 | .11148862E+07 |
| 87 | .10104268E+07 |
| 88 | .90951992E+06 |
| 89 | .81072689E+06 |
| 90 | .71329474E+06 |
| 91 | .61633592E+06 |
| 92 | .52941006E+06 |
| 93 | .44017549E+06 |
| 94 | .36034136E+06 |
| 95 | .28706038E+06 |
| 96 | .22142478E+06 |
| 97 | .16267415E+06 |
| 98 | .10626377E+06 |

# APPENDIX C.2

## PROGRAM CURE

## SAMPLE OUTPUT

..

WHAT IS SAMPLE?

GULF ATS 50 G EVAL.

BY WHAT KINETIC METHOD WAS DATA FOUND?
MULTIPLE SCANS/DSC

ENERGY OF ACTIVATION?19.900

ORDER OR REACTION(S)? (IF THERE IS NO ORDER MAKE N=0)0

DO YOU WANT AF(C) AND G(C) PRINTED?YES

| PERCENT | AFC | |
|---|---|---|
| 14 | .57156417E+07 | .20852549E+07 |

| % OF C | AF(C) | G(C) |
|---|---|---|
| 0 | .20852549E+07 | 0. |
| 1 | .21424113E+07 | .47316073E-08 |
| 2 | .21995677E+07 | .93386001E-08 |
| 3 | .22567241E+07 | .13827375E-07 |
| 4 | .22738074E+07 | .18241931E-07 |
| 5 | .23515481E+07 | .22567145E-07 |
| 6 | .24327397E+07 | .26748699E-07 |
| 7 | .25166769E+07 | .30790742E-07 |
| 8 | .25652591E+07 | .34726610E-07 |
| 9 | .26368209E+07 | .38571954E-07 |
| 10 | .26727999E+07 | .42338874E-07 |
| 11 | .27127953E+07 | .46052689E-07 |
| 12 | .27599353E+07 | .49707443E-07 |
| 13 | .27884618E+07 | .53312183E-07 |
| 14 | .28199494E+07 | .56878367E-07 |
| 15 | .28420162E+07 | .60410763E-07 |
| 16 | .28558923E+07 | .63920844E-07 |
| 17 | .28849835E+07 | .67404722E-07 |
| 18 | .29187519E+07 | .70850895E-07 |
| 19 | .29486649E+07 | .74259639E-07 |
| 20 | .29491786E+07 | .77650709E-07 |
| 21 | .29666067E+07 | .81031524E-07 |
| 22 | .29956269E+07 | .84398051E-07 |
| 23 | .29992366E+07 | .87722241E-07 |
| 24 | .30164546E+07 | .91046907E-07 |
| 25 | .30267524E+07 | .94356418E-07 |
| 26 | .30423478E+07 | .97651821E-07 |
| 27 | .30581706E+07 | .10093025E-06 |
| 28 | .30577325E+07 | .10420042E-06 |
| 29 | .30601862E+07 | .10746950E-06 |
| 30 | .30500511E+07 | .11074271E-06 |
| 31 | .29878389E+07 | .11405547E-06 |
| 32 | .30792629E+07 | .11735269E-06 |
| 33 | .31093431E+07 | .12058451E-06 |
| 34 | .31142447E+07 | .12379809E-06 |
| 35 | .31142713E+07 | .12700913E-06 |
| 36 | .31252827E+07 | .13021450E-06 |
| 37 | .31345174E+07 | .1234[illegible]949E-06 |
| 38 | .31324466E+07 | .13660083E-06 |
| 39 | .31244527E+07 | .13979731E-06 |
| 40 | .31180040E+07 | .14300119E-06 |
| 41 | .31200509E+07 | .14670731E-06 |

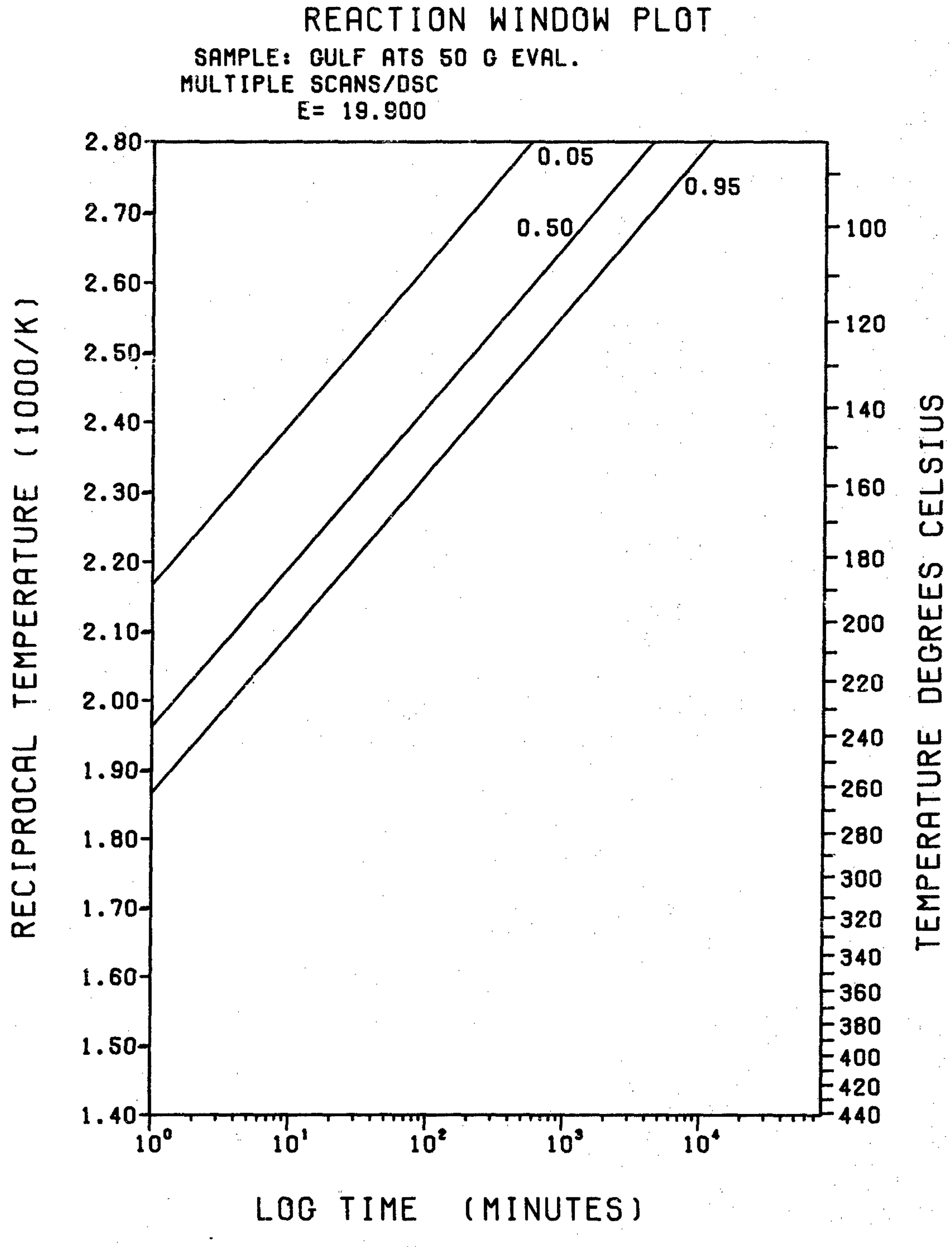
| | | |
|---|---|---|
| 42 | .31221499E+07 | .14941131E-06 |
| 43 | .31292697E+07 | .15261058E-06 |
| 44 | .31306019E+07 | .15580554E-06 |
| 45 | .31279903E+07 | .15900115E-06 |
| 46 | .31231987E+07 | .16220054E-06 |
| 47 | .31189853E+07 | .16540455E-06 |
| 48 | .31158618E+07 | .16861233E-06 |
| 49 | .31105374E+07 | .17182446E-06 |
| 50 | .31042840E+07 | .17504257E-06 |
| 51 | .30969672E+07 | .17826773E-06 |
| 52 | .30857187E+07 | .18150258E-06 |
| 53 | .30709962E+07 | .18475109E-06 |
| 54 | .30561041E+07 | .18801529E-06 |
| 55 | .30420570E+07 | .19129499E-06 |
| 56 | .30273463E+07 | .19459023E-06 |
| 57 | .30086715E+07 | .19790370E-06 |
| 58 | .29870385E+07 | .20123946E-06 |
| 59 | .29619491E+07 | .20460144E-06 |
| 60 | .29341015E+07 | .20799362E-06 |
| 61 | .29033402E+07 | .21141987E-06 |
| 62 | .28694670E+07 | .21488451E-06 |
| 63 | .28349742E+07 | .21839068E-06 |
| 64 | .27974740E+07 | .22194169E-06 |
| 65 | .27544551E+07 | .22554425E-06 |
| 66 | .27092683E+07 | .22920501E-06 |
| 67 | .26613993E+07 | .23292924E-06 |
| 68 | .26113075E+07 | .23672270E-06 |
| 69 | .25604960E+07 | .24059020E-06 |
| 70 | .25026545E+07 | .24454082E-06 |
| 71 | .24377786E+07 | .24858975E-06 |
| 72 | .23702077E+07 | .25275032E-06 |
| 73 | .23013382E+07 | .25703248E-06 |
| 74 | .22308047E+07 | .26144648E-06 |
| 75 | .21521272E+07 | .26601110E-06 |
| 76 | .20669165E+07 | .27075345E-06 |
| 77 | .19796255E+07 | .27569824E-06 |
| 78 | .18910669E+07 | .28086798E-06 |
| 79 | .18032011E+07 | .28628484E-06 |
| 80 | .17135667E+07 | .29197558E-06 |
| 81 | .16178828E+07 | .29798392E-06 |
| 82 | .15194932E+07 | .30436495E-06 |
| 83 | .14172920E+07 | .31118338E-06 |
| 84 | .13157593E+07 | .31851132E-06 |
| 85 | .12159430E+07 | .32642344E-06 |
| 86 | .11148862E+07 | .33502024E-06 |
| 87 | .10104268E+07 | .34445341E-06 |
| 88 | .90951992E+06 | .35489922E-06 |
| 89 | .81072689E+06 | .36656393E-06 |
| 90 | .71329474E+06 | .37974036E-06 |
| 91 | .61633592E+06 | .39486314E-06 |
| 92 | .52941006E+06 | .41242008E-06 |
| 93 | .44017549E+06 | .43322366E-06 |
| 94 | .36034136E+06 | .45845849E-06 |
| 95 | .28706038E+06 | .48975216E-06 |
| 96 | .22142478E+06 | .52975113E-06 |
| 97 | .16267415E+06 | .58206846E-06 |
| 98 | .10626377E+06 | .66085747E-06 |

```
DO YOU WANT ANOTHER PLOT?NO
     STOP
     031200 MAXIMUM EXECUTION FL.
        .467 CP SECONDS EXECUTION TIME.
```

# APPENDIX C.3

## PROGRAM CURE

## SAMPLE OUTPUT PLOT


REACTION WINDOW PLOT
SAMPLE: GULF ATS 50 G EVAL.
MULTIPLE SCANS/DSC
E= 19.900
0.05
0.50
0.95
2.80
2.70
2.60
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
RECIPROCAL TEMPERATURE (1000/K)
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
TEMPERATURE DEGREES CELSIUS
$10^0$
$10^1$
$10^2$
$10^3$
$10^4$
LOG TIME (MINUTES)